A CLINICAL ASSESSMENT AND EVALUATION OF MANTHA SANNI (AUTISM SPECTRUM DISORDER) WITH SIDDHA THERAPEUTIC MANAGEMENT IN CHILDREN

(DISSERTATION SUBJECT)

THE TAMILNADU DR. M.G.R MEDICAL UNIVERSITY

For the partial fulfilment of Requirements to the Degree of

DOCTOR OF MEDICINE (SIDDHA)

Branch-IV Department of Kuzhandhai Maruthuvam

Under the guidance of

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DECLARATION BY THE CANDIDATE

I **Dr.G.DHARSHINI PRIYA** declare that this dissertation entitled *"A Clinical Assessment and Evaluation of Mantha sanni (Autism Spectrum Disorder) with Siddha Therapeutic management in Children"*is a bonafide and genuine research work carried out by me under the guidance of Dr**.**P.ARUL MOZHI M.D(S), Ph.D., Lecturer**,**Department of Kuzhandhai Maruthuvam, National Institute of Siddha, Chennai -47, and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

Date: **Signature of the Candidate**

Place: Chennai-47 (Dr.G.Dharshini Priya)

CERTIFICATE

This is to certify that this dissertation entitled on *"A Clinical Assessment and Evaluation of Mantha sanni (Autism Spectrum Disorder) with Siddha Therapeutic management in Children*" has been carried out by **Dr. G.Dharshini Priya** Reg No.321514203 during the year 2015-2018 in the Department of Kuzhanthai Maruthuvam, National Institute of Siddha, Tambaram sanatorium, Chennai under my guidance and supervision in partial fulfilment of regulation laid by The Tamilnadu Dr.M.G.R Medical University, Chennaifor the final M.D (Siddha), Branch IV – KUZHANTHAI MARUTHUVAMExamination to be held in OCTOBER – 2018. This dissertation work is not reprinted or reproduced from the previous dissertation work.

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CONTENTS

1. INTRODUCTION

Special-needs children is a wall to wall term those who have both physical and mental disabilities caused by neuronal damage. The percentage of disabled children in developing countries is generally higher than in developed countries, it is estimated that 6 to 10% of children in India are born disabled. Developmental disabilities are some of our intent to develop a series of items that would reflect both positive and negative parent appraisals. The most common developmental disorder is Mental retardation, cerebral palsy, Autism spectrum disorder etc. Although there are many physical disabilities in children, but Autism are most common mental disabilities in childhood with unknown aetiology nowadays.

The Word Autism comes from the Greek word "Autos" which means self. It describes condition in which a person removed from social interaction. In other words, he becomes an "isolated self". Eugen Bleuler, a swiss psychiatrist was the first person to use this term. Autism spectrum disorder is a group of complex neurodevelopmental disorders characterized by repetitive and characteristics patterns of behaviour and difficulties with social communication and interaction [1].

The latest analysis from the centres for Disease control and prevention estimate that 1 in 68 has ASD. The Early signs of ASD can be seen by above 18 months after birth. The prevalence of autism is on the alarming rise, with some studies suggesting the increase of 10% to 17% annually in the last several years. Also, autism is far more likely to affect boys than girls, a fact that is still unexplained. In the all over the world, it is believed that 1 in 42 boys and 1 in 189 girls are suffering from it .This surveillance study identified 1 in 68 children. That represents a tenfold rise in the past 40 years. In India, more than 10 million children suffer from autism. We found about 1 to 1.5 % autistic children between ages 2-9 years says Dr. N.K. Arora, Executive director of the international clinical epidemiology network trust which led the study. That means the prevalence rate is 23 children of every 10,000 children in India. In Tamil nadu, the prevalence rate is 1:116 and in Chennai, that is 1:100[2].

Presently, Supportive therapies for training the children with ASD like occupational therapy, Behavioural therapy, Speech therapy, Psychotherapy etc. are being used certain medication like Antipsychotic drugs are also used in severe condition, till now its quite challenge to manage the children with ASD existing therapy. At this juncture, our Siddha

management procedures (Internal and external) would be an invaluable service to this children In India, Siddha system of medicine owes its origin to medicinal ideas and practices of a class of Tamil sages. In the Siddha system of medicine, herbs, minerals, metals and salts all have been used for paediatric population. Siddha system of medicine includes Mind–body interventions, Biological based therapies such as drug formulations and diets, Manipulative and body based methods such as thuvalai and pugai.

In our siddha paediatric text, the definition for மந்தம் & சன்னி respectively மந்தம் என்பது அருவ நிலையில் அகக்கருவியாகிய மனம், புத்தி, அகங்காரம், சித்ததிலும் மந்தம் & சன்னி என்பது அறிவு கலக்கம், வாய் பிதற்றல், இடை விடாமல் அலறுதல். The symptoms of மந்த சன்னி are nearly correlated with Autism Spectrum Disorder (ASD) [3].

Thus the aim and objectives of the present study were to test the efficacy of the Siddha medicines/methodologies in ASD children. In order to the drugs chosen for the project included Kuruver Kudineer as internal medicine[4], Sambrani Thuvalai for thuvalai[5] and Mysatchi Pugai[3] for fumigation therapy as external, all of which have been used in the Siddha system of medicine for many centuries either singly or in various combination. All the ingredients in both Internal and External medicines are herbal. Hence we have choosen the Siddha management therapy and it showed safe and efficacies in treating ASD children.

2. AIM AND OBJECTIVES

2. Aim

To evaluate the Siddha therapeutic management and to analyse the clinical assessment of Mantha sanni (Autism Spectrum Disorder) with Experimental formulations and procedures

2.1. Primary objectives

- ☑ To calibrate the resemblance and the equivalence of Mantha Sanni with Autism Spectrum Disorder
- ☑ To explore the siddha therapeutic management in Autism children

2.2Secondary objectives

- ☑ To evaluate the physicochemical, biochemical analysis and pharmacological activities of the trail drug
- ☑ To Collect authentic measures and review the ideas mentioned in the ancient siddha literature about the disease mantha sanni
- ☑ To study the clinical features, diagnosis, Investigations and treatment of mantha sanni from various siddha literatures.
- ☑ To Study the disease Mantha sanni on the basis of mukkutram and the associated changes in the physiological functions of the human body as per siddha literature.
- ☑ To Study the disease Mantha sanni on the basis of age, sex, economical status, envagai thervu, udalthathukal, Nerkuri and neikuri.
- ☑ To study the clinical parameters of Mantha sanni for the assessment of Social relationship, Emotional responsiveness, Communation skills, Behavioural patterns and sensory aspects.
- ☑ To make the correlative study of signs and symptoms of the disease Mantha sanni with Autism spectrum disorder.

3. REVIEW OF LITERATURE

3.1. SIDDHA ASPECT

மாந்தம்

இயல்

‘மந்த இயல்புடையது மாந்தம்’[3]

மந்தம் என்பது உருவநிலையில் உடல்நிலையில் மந்தம்.
அருவநிலையில் அகக்கருவியாகிய மனம்,புத்தி,அகங்காரம் சித்தத்திலும் மந்தம் என்றும் உயர்நிலையில் மந்தம் என்றும் விரித்துக்கொள்ளலாம்.

-பாலவாகடம்.

உண்ட உணவு செரியாமால் வயிற்றில் புளித்து,வயிறுப்பி இரைந்து மந்தத்தை உண்டாக்கி வாந்தியையும்,கழிச்சலையும், உண்டாக்கி துன்பத்தை ஏற்படுத்தும் நோய்.

- பிள்ளைபிணி பாகம் 2.

குழந்தைகளுக்கு பால், அன்னம், நெய், பழங்கள், வித்துக்கள், பயிறு, தேங்காய், வாழைக்காய் ஆகிய அடர்த்தியான மாப்பொருட்கள், கொழுப்புப்பொருட்கள் மற்றும் சீரணிக்கக் கடினமானதான பதார்த்தங்கள் உட்கொள்ளப்படும்போது சுரம் ஏற்பட்டு குறிப்பாக கால் குளிர்ந்தால் மாந்தநோய்க்கு அடையாளம் ஆகும்.

-பாலவாகடம் - பாலரோகநிதானம்.

வேறுபெயர்

மந்தம், அலசம், அலசகம்.[6]

-பிள்ளைப்பிணி பாகம் 2.

நோய் எண்

பாலவாகடம் - மாந்தம் 21, 10, 8[3].

பிள்ளைபிணி மருத்துவம் - மாந்தம் 43[7].

கும்பமுனி பாலவாகடம் - மாந்தம் 13[8].

பதினெண்சித்தர்கள் வைத்திய சில்லரைக்கோவை - மாந்தம் 8[9].

நோய்வரும் பருவங்கள்

முதலாண்டு முதல் மூன்றாண்டுகள் தொடரும்.

‘‘ஆண்டொன்றைத் தொட்டே யகல்மூன்றா மாண்டளவும்

தாண்டுமே மாந்தநோய் தான்’’.

அவை தாலப்பருவம், முத்தப்பருவம், சப்பாணிபருவம், வருகைபருவம்.

-பாலவாகடம்

மாந்தம் 3 மாதம் முதல் 12 வயது வரை வரக்கூடியது.

பால்மட்டும் குடிக்கும் பருவம், பாலும் சோறும் உண்ணும் பருவம், சோறுமட்டும் உண்ணும் ஆகிய மூன்று பருவங்களிலும் மாந்தம் ஏற்படும்.

-பிள்ளைபிணி பாகம் 2.

நோய்வரும் வழி

குழந்தை பிறந்த பின்பும் தாயிடத்தில் உற்பத்தியாகும் பாலை உண்டே அது வளருகின்றது. அதனாற் குழந்தை பெற்றதாய் உண்ணும் உணவின் சக்தியைப் பொறுத்தே தாயப்பாலின் தன்மையும் இருக்கும். குழந்தை வளர்ச்சிக்கு இடையூறு செய்யக்கூடிய சில பொருள்களைத் தாய் விலக்க வேண்டும். அவ்விதம் விலக்காமல் தன் உணவாகச் சேர்த்து உண்டால் அதிலிருந்து கிடைக்ககூடிய ஊட்டச்சத்தானது முக்குற்ற மிகுகுறை நிறை நிலையில் குழந்தையினுடைய உடல்நிலையைப் பாதிக்கும். அதனால் குழந்தைக்கு மாந்தம் ஏற்படுகிறது.

குழந்தை பிறந்த ஒரு ஆண்டிற்குள் நீர்நிலைகளில் பழுத்து உதிர்ந்த சருகுகள் விழுந்து அழுகிருக்கும் நீரைக்குடிப்பதாலும், எருமைப்பால், புளித்த எருமை மோர், எருமை நெய், வாழைப்பழம், மாம்பழம், தேங்காய், இளநீர், கடலை, வெல்லம், மாவினாற்செய்யப்பட்ட பொருள், வாயுப்பொருட்கள், சோறு இவைகளை அதிகமாக உண்பதாலும்,

பாகற்காய், கள், ஊன், பெரிய உளுவை மீன், வாளைமீன், பன்றி, வரால்மீன், கெண்டைமீன் இவைகளை உண்பதாலும், சுரமடித்தல் என்னும் பல காரணங்களால் தாய்க்கு மலச்சிக்கல் ஏற்பட்டு, அவளது உடல் கனத்து துன்பப்படும்போது குழந்தையானது அத்தாயினிடம் பால்குடித்தால் மயிர்கூச்சத்துடன் கூடிய காய்ச்சல் உண்டாகும். அத்துடன் மிகக் கழிச்சல் ஏற்பட்டு மாந்தநோய் உண்டாகும்.

-பாலவாகடம்.

மாந்தத்தின் பொதுக்குறிகுணங்கள்[3]

‘‘வாய்ந்த பலவவை வழுத்தல் கேளாய்
குழந்தை யுடலங் கொள்ளல் கனதி
விழைந்து நோதல் வேர்த்தல் சோர்ந்து
கிடத்தல் காய்தல் கிளரழ னாற்றம்
படுதலை மயக்கம் பார்வை சேத்தல்
கண்கள் சுழலல் கண்கள் குழிதல்
கண்ணு முகம்பல வாக வெளுத்துப்
பண்ணு மொளிதரல் பகர்குர றாழ்தல்
திண்வா யுலரல் சேர்முலை யுண்ணா
தெண்ணும் வாந்தி யேற வெடுத்தல்
பசியி ராமை பலநிற பேதி
கசியுஞ் சீதமு மலமுங் காணல்
கெட்ட பால்போல் கிளர்தண் ணீர்போல்
விட்ட பேதி விதமாய்க் காணல்

கைகால் பின்னல் கைகால் குளிரல்
கையிற் றங்காக் கலங்கித் துள்ளல்
என்னு மிவையே யென்றனர்
மன்னிய முன்னூல் மாண்புடை யோரே”

1. குழந்தையின் உடம்பு கனத்திருக்கும், நோதல் உண்டாகும்.
2. மிகுதியான வியர்வை உண்டாகும், விடாத சுரமிருக்கும்.
3. குழந்தைக்கு சுறுசுறுப்பு இல்லாமல் சோர்ந்து இருக்கும்.
4. உடம்பிலிருந்து ஒரு வித வெப்புநாற்றம் உண்டாகும்.
5. மயக்கம் உண்டாகும், கண்விழி குழிவிழுந்து காணப்படும்.
6. முகம் வெளுத்து ஒருவகை மங்கிய ஒளி காணும்.
7. குரல் தாழ்ந்து காணப்படும், வாய் உலரும்.
8. தாயினிடம் பால் உண்ணாது.அடிக்கடி வாந்தி உண்டாகும். பசி ஏற்படாது
9. சீதமும் மலமுமாகவும், கெட்டுப்போன பால் போலவும், தண்ணீர் போலவும், பலநிறமாகவும் பேதியாகும்.
10. கைகால் பின்னிக்கொள்ளும், கைகால்கள் சூடு இல்லாமல் குளிர்ந்து போகும்.
11. குழந்தை கையில் தங்காமல் அழுவதோடு துள்ளும்.

-பாலவாகடம்.

மந்தமது வரலாறு சொல்லக் கேளிர
மாதரோடு பாலகரு மருந்துந் தீனி
சேர்ந்ததொரு பால்தனில் விசந்தான் கொண்டு
சிறுவருக்கு உதரத்தில் மந்தம் பற்றி
ஊர்த்தெழுந்த திரையினால் விரணங்கொண்டு
உள்விரணம் பலநோவு உறவதாகி
சார்ந்த மலம் சிக்கியதில் தோசமுண்ணாய்
தானெழும்பும் மாந்தவகை சாற்றுவேனே

-பிள்ளைபிணி பாகம் 2

மாந்தநோய் வகைகள்

1.வளி
2.அழல்
3.ஐயம்
4.விடம்
5.போர்
6.வாலை
7.சுரம்
8.நீர்
9.செரியாமை

10.கட்டு

11.பால்

12.எரி

13.துலை

14.தலை

15.கணம்

16.வலிப்பு

17.சுழி

18.முக்கு

19.சந்நி

20.ஊதல்

21.வீக்கம்

-பாலவாகடம்.

மருத்துவ அறிஞர்கள் கூறும் 10 வகைகள்

1.உப்பல்

2.வாந்தி

3.வறட்சி

4.திட்டு

5.உளை

6.அக்கரம்

7.பேய்

8.நீர்கணம்

9.தோடம்

10.கருப்பம்.

–பாலவாகடம்.

எண்வகை மாந்தம்

1.பொதுமாந்தம்

2.செரியாமாந்தம்

3.தலைமாந்தம்

4.போர்மாந்தம்

5.கட்டுமாந்தம்

6.விடமாந்தம்

7.நீர்மாந்தம்

8.கழிமாந்தம்.

–பாலவாகடம்.

கும்பமுனி பாலவாகடம் - 13வகை மாந்தம்

1.வாதமாந்தம்
2.பொருமல்மாந்தம்
3.வரள்மாந்தம்
4.பித்தமாந்தம்
5.சிலேற்பமாந்தம்
6.நடுக்குமாந்தம்
7.குளிர்மாந்தம்
8.போர்மாந்தம்
9.பால்மாந்தம்
10.விஷமாந்தம்
11.இரைமாந்தம்
12.பொதுமாந்தம்
13.சக்திமாந்தம்.

பிள்ளைபிணி மருத்துவம் 2 - 43வகை மாந்தம்

1.அடைமாந்தம்
2.அட்சஅக்கரமாந்தம்
3.அழல்மாந்தம்
4.அள்ளுமாந்தம்
5.இழுப்புமாந்தம்
6.உப்பல்மாந்தம்
7.உப்புமாந்தம்
8.உளைமாந்தம்
9.ஊதுமாந்தம்
10.எரிமாந்தம்
11.ஐயமாந்தம்
12.கட்டுமாந்தம்
13.கணமாந்தம்
14.கர்ப்பமாந்தம்
15.கணைமாந்தம்
16.கல்மாந்தம்
17.கழிமாந்தம்
18.சக்திமாந்தம்
19.சந்நிமாந்தம்
20.சந்நிபாதமாந்தம்
21.சுரமாந்தம்
22.சுழிமாந்தம்
23.செரியாமாந்தம்

24.தலைமாந்தம்
25.திட்டுமாந்தம்
26.நீர்கணமாந்தம்
27.துளைமாந்தம்
28.தோஷமாந்தம்
29.நீர்மாந்தம்
30.பால்மாந்தம்
31.புல்மாந்தம்
32.பேதிமாந்தம்
33.பேய்மாந்தம்
34.போர்மாந்தம்
35.மலடிமாந்தம்
36.முக்குமாந்தம்
37.வலிப்புமாந்தம்
38.வளிமாந்தம்
39.வறட்சிமாந்தம்
40.வாந்திமாந்தம்
41.வால்மாந்தம்
42.விடமாந்தம்
43.வீக்கமாந்தம்.

சுந்நி மாந்தம்[3] :

பத்தியத் தாழ்வால் மாந்தம்
பகைசெயும் விதங்கள் மெத்த
சுற்றிய மயக்க முண்டாய்ச்
சோல்லொணாச் சந்நி யெய்தும்
முற்றிய சுரமுந் தாக
முதிர்ந்திடு நாவின் முள்ளு
புத்தியுங் கலங்கிக் கண்ணும்
போதவே தாழுந் தானே

உருக்குஞ் சந்நி மாந்தகுணம்
ஓயா தலறும் வாய்பிதற்றும்
ஒருகண் திறந்து மொருகண்ணை
யுருட்டி விழித்துப் பார்த்துமழும்
துருக்கு மூசி போல்கழுத்து
துவள நொந்தே யுடலமெலாம்

பெருக்க நரம்புந் தான்தெறித்துப்
பிழியும் பாசி போல்வழியே

அன்றியும்,

தொலைவில் தாகமு மயக்கமு மறிவுதொந் தித்தல்
தலைபு ரட்டல்கால் குளிர்ந்திட னாவில்முள் தடித்தல்
மலைவு செய்வெறும் வாந்தியு மேப்பமும் வலிப்பும்
சிலைநு தற்கணே சந்நிமாந் தம்மெனச் செப்பே.

மாம்மமே கோபித் தக்கல்
வயிறுபோ முப்பிக் கொள்ளும்
மாந்தமே கோபித் தக்கால்
வாய்தனை வெருவிச் சீறும்
மாந்தமே கோபித் தக்கால்
மயங்கியே குளிர்ந்து காணும்

மாந்தமே கோபித் தக்கால்
.....
காந்தல் போல் மேனி தானும்
கருகியே வெருவிச் சேரும்
சேர்ந்ததோர் பச்சை வெள்ளை
சிவந்துமேல் மலமுந் தீயும்
வாந்தியே பண்ணுங் கண்டாய்
வலிப்புடன் சந்நி தானே.

குறிகுணங்கள்:

அறிவு கலக்கம்
இடை விடாமல் அலறுதல்
வுாய் பிதற்றல்
கண் தாழ்வு
ஒரு கண் திறந்திருக்க மற்றொரு கண்ணை உருட்டி பார்த்தல்
உடம்பெல்லாம் வலி எடுத்தல்
கை கால் சில்லென்று இருத்தல்
வாந்தி, ஏப்பம்
நாவின்முள்
வலிப்பு

MANTHA SANNI AND AUTISM SPECTRUM DISORDER:

மந்த சன்னி	ASD
• அறிவு கலக்கம்	• Impairment of social behaviour , interaction and in confused state
• இடை விடாமல் அலறுதல்.	• Aggressive behaviour – outburst of crying, laughing or anger.
• வாய் பிதற்றல்	• Sustained unusual verbal skills, echoes words or phrases
• கண் தாழ்வு, ஒரு கண் திறந்து இருக்க மற்றொரு கண்ணை உருட்டிப் பார்த்தல்	• poor eye contact or starring from unusual angle
• உடம்பெல்லாம் வலி எடுத்தல், கைகால் சில்லென்று இருத்தல்	• Body pain and neurological symptoms
• வலிப்பு, • நாவின் முள், வாந்தி, ஏப்பம்.	• Seizure • Mouth ulcer, vomiting, belching(Indigestion)

பிணி அறியும் முறைகள் (Diagnosis)[10]

" நோய்நாடி நோய்முத னாடியது தணிக்கும்
வாய்நாடி வாய்ப்பச் செயல்". -திருக்குறள்.

Siddha system has a very unique method for diagnosis. This is based upon three principles.[10]

1.பொறியாலறிதல் (Inspection)

2.புலனாறிதல் (Palpation)

3.வினாதல் (Interrogation)

1. பொறியாலறிதல் (poriyall arithal)

Porigal means the five sense organs. These are eyes, ears, nose, tongue and skin. Poriyall arithal is examining the five sense organ of the patient by the five sense organ of the physician.

In Mantha sanni,

Mei (skin)	- normal
Vaai (tongue)	-normal
Kan (eye)	-normal
Mookku (nose)	-normal
Sevi (ear)	-normal

2. புலனாறிதல் (Pulanaal arithal)

Pulan means sense of perception from the five sense organs. That means understanding by the sense objects.

In Mantha sanni

Ooru (sensation)	– normal
Oosai (sound)	– normal
Oli (vision)	– normal
Suvai (taste)	–normal
Naatram (smell)	– normal

3. வினாதல் (Vinaathal)

Vinaathal means, the physician knows about the patients name, age, occupation, family history, socio-economic status, diet and habits, complaints relevant to disease in his family by asking questions.

சித்த மருத்துவத்தில் நோயினை கணிக்க பயன்படும் முறைகள்[10]

1. திணை
2. காலங்கள்
3. சுவை
4. உயிர்த்தாதுக்கள்
5. உடற்கட்டுகள்
6. எண்வகைத்தேர்வு

1. திணை

திணை என்பது நிலம், பூமி, தரை, இடம். மண் என பல பெயர்களால் வழங்கப்படும். திணை -5 வகைப்படும்

குறிஞ்சி – சிலேத்தும நோய் உண்டாகும்.

முல்லை – பித்தநோய் உண்டாகும்.

நெய்தல் - வாதநோய் உண்டாகும்.

மருதம் - எந்தவித நோய்களும் உண்டாகாது.

பாலை – வாத, பித்த, கபநோய்கள் உண்டாகும்.

-நோய்நாடல் நோய்முதனாடல்

2. காலங்கள்

பன்னிரண்டு திங்கள் கொண்ட ஓர் ஆண்டை ஆறு பிரிவுகளாகப் பிரிக்க, ஒவ்வொரு பிரிவும் இரண்டுரண்டு திங்களைக் கொள்ளும். இரண்டு திங்களைக் கொண்ட ஒவ்வொரு பிரிவும் காலம் (அ) பருவம் எனப்படும். ஆவை

1. கார்காலம் - ஆவணி, புரட்டாசி
2. கூதிர்காலம் - ஐப்பசி, கார்த்திகை
3. முன்பனிக்காலம் - மார்கழி, தை
4. பின்பனிக்காலம் - மாசி, பங்குனி
5. இளவேனிற்காலம் -சித்திரை, வைகாசி
6. முதுவேனிற்காலம் -ஆனி, ஆடி

-சித்த மருத்துவாங்கச் சுருக்கம்.

மேற்கூறிய காலங்களில் வளி, அழல், ஐயம், மூன்றில் ஏதேனும் ஒன்று அல்லது பல தன்னிலை, தன்னிலை விருத்தி, வேற்றுநிலை வளர்ச்சி எனும் நிலையை அடைவதினால் நாடி நடை மாற்றமடைந்து ஏழு உடற்தாதுக்களில் வேற்றுமை உண்டாகும்.

1. வளி

தன்னிலையடைதல் - கூதிர்காலம்

தன்னிலை வளர்ச்சி – முதுவேனிற்காலம்

வேற்றுநிலை வளர்ச்சி – கார்காலம்

2. அழல்

தன்னிலையடைதல் - முன்பனிக்காலம்

தன்னிலை வளர்ச்சி – கார்காலம்

வேற்றுநிலை வளர்ச்சி – கூதிர்காலம்

3.ஐயம்

தன்னிலையடைதல் - முதுவேனிற்காலம்

தன்னிலை வளர்ச்சி – பின்பனிக்காலம்

வேற்றுநிலை வளர்ச்சி – இளவேனிற்காலம்

-நோய்நாடல் நோய்முதனாடல்.

3.சுவை

இரண்டிரண்டு பூதங்களில் கூட்டுறவினால் சுவை பிறக்கின்றது.

இனிப்பு – மண் + நீர்

புளிப்பு – மண் + தீ

உப்பு - நீர் + தீ

கைப்பு – காற்று + விண்

கார்ப்பு – காற்று + தீ

துவர்ப்பு – மண் + காற்று.

முத்தோடங்களை மிகுதிபடுத்தும் சுவைகள்

''புளிதுவர்விஞ் சுங்கறியாற் பூரிக்கும் வாதம்
ஒளியுவர்கைப் பேறில் பித் துச் சீறும் - கிளிமொழியே
கார்ப்பினிப்பு விஞ்சிற் கபம்விஞ்சுஞ் சட்டிரதச்
சேரப்புணர் நோயணு காதே''.

முத்தோட மிகுதியைச் சமனஞ் செய்யும் சுவைகள்

''வாத மேலிட்டால் மதுரம் புளியுப்பு
சேதமுறஞ் செய்யும் சிறையும் -ஓதக்கேள்
காரந் துவர்கசப்புக் காட்டும் சுவையெல்லாம்
சாரப் பரிகாரஞ் சாற்று''.

''பித்த மதிகரிப்பின் பேசும் பரிகாரம்
சுத்தத் துவரோடு சொல்லினிப்புச் - சத்தாகும்
கைப்புச் சுவையே கருதவதன் வீறு
எய்ப்படையு மென்றுரைத்தா ரிங்கு''.

-கண்ணுசாமியம்.

4. உயிர்தாதுக்கள்

உயிர்தாதுக்கலாகிய வளி, அழல், ஐயம் ஆகிய முக்குற்றங்களே எல்லாப்பிணிக்கும் காரணமாகும்.

5.முக்குற்றங்களின் பொதுகுணம்

1. Vali (வாதம்)

Site of vatham in body (வாதம் வாழுமிடம்)

Abaanan, faces, idakalai, below the umblical region, spermatic cord, pelvic bones, skin, nerve plexus, joints, hair follicle, muscle, alimentary tract, bones, ear and thighs.

மேலும்

''அறிந்திடும் வாத மடங்குமலத்தினில்''

-திருமூலர்.

''நாமென்ற வாதத்துக் கிருப்பிடமே கேளாய்

நாபிக்குக் கீழென்று நவில லாகும்''.

–யூகி முனிவர்.

என்பதால் மலமும், நாபிக்கு கீழிடமும் வாதமிருக்குமிடங்கள் என கொள்ளலாம்.

Vatham consists of 10 types [10]

1. Praanan (Uyirkaal)

This controls knowledge, mind and five sense organs, which are useful for breathing and digestion. In Mantha sanni, praana vaayu is affected leading to sleep distubances, Poor appetite, Indigestion and aggressiveness.

2. Abaanan (Keezhnokkukaal)

This responsible for all downward movement such as passing urine, stools, semen and menstrual flow. Abaanan vaayu is affected in mantha sanni leading to constipation.

3. Samaanan (Nadukkal)

This aids in proper digestion and controls other vaayus.In Mantha sanni, this vaayu is altered leading to poor appetite, Indigestion and cannot control the other vaayus.

4. Viyaanan (paravukaal)

This is responsible for all movement of all parts of the body and distribution of saaram. This vaayu is not affected in mantha sanni.

5. Uthaanan (melnokkukaal)

Responsible for all upward visceral movements such as vomiting and nausea.Then distributes the saaram equally to all tissues. This vaayu is not affected in mantha sanni.

6. Naagan

Responsible for opening and closure of eye lids and is not affected in Mantha sanni

7. Koorman

Responsible for vision and yawning. Koorman is not affected in Mantha sanni

8. Kirukaran

This is responsible for salivation, nasal secretion, sneezes, coughs and maintains the appetite. In mantha sanni, this vaayu is affected because poor appetite present.

9. Devathatthan

This is responsible for tiredness, anger and emotional expression. This vaayu is affected in mantha sanni because of aggressiveness, frustuation, hyperactivity and impaired emotional skills.

10. Dhananjeyan

It produces swelling of the body after death. It escapes on the third day after death bursting out of the cranium.

B. Azhal (பித்தம்)

Sites of pitham in body (பித்தம் வாழுமிடம்)

Pinkalai, praanavayu, urinary bladder, moolakkini, heart, head, umblical region, stomach, sweat, saliva, blood, saaram, eyes and skin.

மேலும்

‘‘ பிரிந்திடும் பித்தம் பேராம் சலத்தினில்’’.

-திருமூலர்.

‘‘போமென்ற பித்தத்துக் கிருப்பிடமே கேளாய்

பேரான கண்டத்தின் கீழ தாகும்’’.

– யூகி முனிவர்.

என்பதனால் சிறுநீரும், கண்டத்தின் கீழிடமும் பித்தம் இருப்பிடமாகும்.

Pitham consists of 5 types [10]

1. Anal pitham

It promotes appetite and helps in digestion.In Mantha sanni, this pitham is affected due to poor appetite and indigestion

2. Ranjagam

It gives colour to the blood. In mantha sanni, some childrens are anaemic.

3. Saadhagam

It is important for day today activities with the help of mind and brain .In Mantha sanni, this Pitham is affected because of Poor social and communication skills, impaired emotional status, Hyperactivity an attention deficit.

4. Prasagam

It gives complexion to skin.In Mantha sanni it is normal.

5. Aalosagam

It brightens eyes and responsible for clear vision .In mantha sanni it is affected due to poor eye to eye contact

C.Iyyam (கபம்)[10]

Sites of kabam in body (கபம் வாழுமிடம்)

Kabam (or) kapham is located in samanavaayu, suzhumunai, sperm, head, tongue, uvula, fat, bonemarrow, blood, nose, chest, nerve, bone, brain, large intestine, eyes, joints and also present in throat, stomach and pancreas.

Kabam consists of five types

1. Avalambagam

It lies in the lungs. It controls the heart and other four kabam. In mantha sanni,it is normal.

2. Kilethagam

It lies in the stomach and gives moisture to food material and also helps for digestion. In mantha sanni, it is affected due to indigestion

3. Pothagam

It lies in tongue and responsible for taste sensation.It is not affected in mantha sanni.

4. Tharpagam

It is present in the head and responsible for coolness of both eyes. It is affected in mantha sanni due to poor eye to eye contact.

5. Santheegam

It is present in joints and responsible for lubrication and free movement of joints .It is not affected in mantha sanni.

5. Udar kattugal (7)[10]

1. Saaram
2. Senneer
3. Oonn
4. Kozhuppu
5. Enbu
6. Moolai
7. Sukkilam/suronitham

When the seven udar kattukal increase or decrease from the normal level, the normal functions of the body will be affected.

In Mantha sanni

1. Saaram: Normal
2. Senneer: Normal
3. Oonn: Normal
4. Kozhuppu: Normal
5. Enbu: Normal
6. Moolai: Normal
7. Sukkilam/suronitham: Normal.

Eight tools of diagnosis [10]

Envagai thervugal is the basic diagnostic principles and the uniqueness of the siddha system of medicine. The following lines are said about this.

''மெய்க்குறி நிறந்தொனி விழி நாவிருமலம் கைக்குறி''

-சித்தமருத்துவாங்கச் சுருக்கம்.

''நாடிப்பரிசம் நாநிறம் மொழிவிழி

மலம்மூத்திரமிவை மருத்துவ ராயுதம்''

-நோய்நாடல் நோய்முதல்னாடல்.

The diagnostic value of Enn vagai thervugal is the unique concept of siddha system of medicine.

Enn vagai thervugal are

1. Naadi (Uyir thathu)
2. Sparisam (Touch feel sensation)
3. Naa (Tongue)
4. Niram (Colour of the skin)
5. Mozhi (Quality and character of speech)
6. Vizhi (Eye)
7. Malam (Stools)
8. Moothiram (Urine)

a) Naadi (Uyir thathu) [10]

'' இடுமென்ற நாடிகள்பார்க்கும் வகையைக் கேளு

ஏன்னவென்றால் நடுவிரல் நீவிப்பின்னே

அடுமென்ற அடுத்தவிரல் மோதிரமாம் விரலை

அப்பனே இளுத்தபின்பு சுண்டுவிரலிளுத்தது

உடுமென்ற தூண்டுவிரலிளுத்து அப்பால்

உத்ததொரு அங்குட்ட டுவிரலைநீ விக்கலத்தில்

படுமென்ற சீயோதி அங்குலமோ தள்ளி

பார்தவிட மூன்றுதரம் சுரம்பார்க்கும் வகையே

வகைஎன்ன வாதமது ஒண்ணரையாம் பித்தம்

வளமையொன்று அய்யங்கால் வளமாய்நிற்கில்

பகையில்லை நாடிகளுந் தொந்த மில்லை

பண்பான்சுகரொசருரூபக் கூறுசொன்னேன்

-அகத்தியர் கனக மணி 100

உடலில் உயிர்தரித்திருப்பதற்கு காரணமான சக்தி எதுவோ அதுவே தாது அல்லது நாடி எனப்படும்.

Otherwise known as uyir thathu,is the principle method for diagnosis in siddha system.. It is responsible for existence of life in the physical body.

Naadi nadai in Mantha sanni

"போகிய தவளை பாம்பு போலவாம் சேத்துமந்நான்"

-நோய்நாடல் முதல் பாகம்

The prime factor, kabam is involved in Mantha sanni and is accompanied with vatham or pitham and produce clinical symptoms of mantha sanni.

b) Sparisam (Touch feel sensation) [10]

தேயமுடனே வாதத்தின் தேசந்தானும்
நேர்மையாய்க் குளிர்ந்து சில விடத்திலே தான்
மாயமுடனு ட்டணமுந் துடிதுடிப்பு
மறுவுதலாம் பித்தத்தின் தேகந்தானும்
தோயவே வுட்டணமதாயிருக்கும் தெளிவாய்
சேத்துமத்தின் தேகமது குளிர்ந்திருக்கும்
புாய தொந்த தேகமது பலவாறாகும்
புரிந்து தொட்டுத் தேகத்தைப் பார்த்துப் பேசே

-கண்ணுசாமி

Identify the heat or coldness of the body, pain and skin nature. In mantha sanni, It may be over sensitive of touch

.

c) Naa (Tongue) [10]

பலமான ருசியறியும் நாவின் கூற்றைப்
பகர்கின்றேன் வாதரோகி யின்றன் நாவு
கலமாக வெடித்து கறுத்திருக்கு மட்போல்
கண்டு கொள்வாய் பித்தரோகி யின்றன் நாவு
நலடுங சிவந்து பச்சென்றிறுக்கும் நட்பிலா
சிலேத்துமரோகி யின்றன் நாவு
தலமதனிலுற்றமுதி யோர்கள் சொன்ன
தன்மையடி தடித்து வெளுத்திருக்கும் பாரே.

-கண்ணுசாமி

It is noted for colour of the tongue local lesion (ulceration, redness), coating deposition of tongue and dryness of the tongue.

In Mantha sanni, some children have ulceration and dryness of tongue.

d) Niram (Colour of skin) [10]

மூன்றாகும் வாதபித்த சிலேத்து மத்தால்
மிகுச்தமுறத் தொந்தித்த ரோகி தேகம்
தோன்றாத சீதய வுஸ்ணங் காலமூன்நுந்
தொகுத்தேன்யான் திரேகத்தி னிறத்தை கேளு
ஊன்றாத வாதவுடல் கறுத்துக் காணும்
ஊரியபித்த முடல் சிவப்புப் பசுமைகாணும்
போன்றாத வையவுடல் வென்மை தோன்றும்
பொருந்துந் தொந்த ரோகவுடற் கிவற்றை யொக்கும்
-கண்ணுசாமி பரம்பரை வைத்தியம்

Colour of skin, conjunctiva, teeth, nail bud and hair are note. In Mantha sanni, it is normal

e) Mozhi (Quality and character of speech) [10]

பார்ப்பதன் வாதரோகி யின்றன் வார்த்தை
பக்குவமாய்ச் சமசத்த மாயிருக்கும்
சேர்ப்பதுதான் பித்தரோகி யின்றன் வார்த்தை
சேப்பக்கோள பெலத்துமே ளுறத்திருக்கும்
ஏற்பதுதான் காரோகி யின்றன் வார்த்தை
யேளிதாகச் சிறுத்திருக்குமியல்பதாகும்
கேசற்கவே யிம் மூன்றுந் தோந்தமபகில்
கூசாமற் பலவிதமாய் பேசுவாரே
-கண்ணுசாமி

Observation of speech and voice.This is said in Agasthiar vallathi.

"வார்த்தையைப் பார்"

In mantha sanni, it is affected due to difficulty in speech or slurred speech present.

f)Vizhi (Eye) [10]

உண்மையாய் கண்குறிப்பதைக் கேள் வாதம்
உற்றவிழி கறுத்து நொந்து நீறுங் காணும்
தண்மையிலாப் பித்தரோகி யின்றன் கண்கள்
சார்பாக பசுமைசிவப் பேறுங்காணும்
வண்மையிலா வையரோகி விழிகள் தானும்
வளமான வெண்மைநிற மேதா நாதம்

திண்மையிலாத் தொந்தரோகி யின்றன் கண்கள்
தீட்டுவாய் பலநிறமென் றறைய லாமே.

-கண்ணுசாமி

By this examination, colour 0f eye (redness, pallor), tears, excreta of eye,disease of eyes are noted.

In mantha sanni, it is affected because of poor eye to eye contact.

g) Malam (Stools) [10]

ஒக்குமே வாத நோய் மலத்தை பார்க்கில்
உகந்த மலம் கறுமியே கறுத்திருக்கும்
மிக்கபித்த நோய்மலத்தை உற்று பார்க்கில்
மிகுந்த சிவப்புடன் பசுமை தானும்
மைகுவளை மானேகே ளைய ரோகம்
மலமதுதான் வெண்ணிற மாயிருக்கும்
பக்குவமா யிம்மூன்றுந் தொந்திப் பாகில்
பகருமின் நிறங்கள் வகை பரிந்து காணும்

-கண்ணுசாமி

Consistenccy of stool (hard or semisolid),diarrhoea, undigested food, fluid resembling the meat washed water, colour ,frothy, dysentery ,bloody, pus, mucus, smell, frequency of defeacation, constipation, quantity of stool are noted. In mantha sanni, patient may be having the symptoms of constipation.

h) Moothiram (Urine) [10]

ஓங்கிய வாதத்தோர்க்கு நீர்விழுங் குணந்தா நூரைக்கின்ற
பூங்கொடி கறுத்து நொந்ர் சிறுத்துமன் பெறுமி வீழும்
பாங்குடன பித்ததோர்க்கும் பசிய நீர் சிவந்து காட்டி
ஏங்கவே கறுக்கதாக எரித்துடன் கடுத்து வீழும்
வீழுமே சிலேற்பனத்தோர் நீர்க்குணம் விளம்பக் கேளாய்
நாளுமெ வெளுத்துரைந்து நலம்பெற வீழுங் கண்டாய்
வாள்விழி மானேதொந்த ரோகமானிடர்க்கும் தானே
தாளுநீர் பலநிறந்தா னெனவே சாற்றி னோமே

-கண்ணுசாமி

Colour of urine (yellow, black white copper colour, mixed colour.Then smell of urine (smell of fire, honey, sweet odours, fruity odour) frothy or not, frequency of urination and quantity of urine are noted. In mantha sanni, there is no specific feature related to the colour of urine.

Neer nira kuri and Nei kuri [10]

This method of urine examination is unique in Siddha medicine.

நீர்நிறக்குறி

"அருந்துமாறிரதமும் அவிரோதமதாய்
ஆக்கல் அலர்தல் அகாலவூன் தவிர்ந்தழற்
குற்றளவருந்தி உறங்கி வைகறை
ஆடிக்கலசத் தாவியே காது பெய்
தொருமுகூர்த்தக் கலைக்குட்படு நீரின்
நிறக்குறி நெய்க்குறி நிருமித்தல் கடனே"

–நோய்நாடல் முதல்பாகம். .

விளக்கம்

நீர்க்குறி பார்க்கும் முதல் நாள் இரவு நன்கு உணவு உண்டு உறங்க வேண்டும். பின் விடியற்காலை படிகபாத்திரத்தில் நீரினைப் பிடித்து அதன் நீர்குறி மற்றும் நிறக்குறியினை கண்டறிதல் வேண்டும்.

Collection of sample urine

The urine is collected on the dawn of the day in a pure glass container and closed immediately to prevent contamination. This specimen must be examined within one and half hours from the collection.

நெய்க்குறி

" நிறக்குறிக் குரைத்த நிருமாண நீரிற்
சிறக்க வெண்ணெய்யோர் சிறுதுளி நடுவிடுத்
தென்றுறத் திறந்தொலி ஏகாதமைத்ததி
னின்றதிவலை போம் நெறிவிழியறிவும்
சென்றது புகலுந் செய்தியை யுணரே"

–நோய்நாடல் நோய்முதனாடல்.

A drop of gingelly oil is dropped on a wide glass vessel containing the urine to be tested which is kept under sunlight in a calm place. The derangement of three dhoshas can be diagnosed by the mode of spread of gingelly oil on the surface of urine.

In mantha sanni, the results of neikuri is pearl like oil floating on urine in patients .

மருத்துவம்

1. வேற்றநிலை வளர்ச்சியடைந்த பித்தத்தினை தன்னிலைப்படுத்த வேண்டும்.
2. தன்னிலை வளர்ச்சியடைந்த ஐயத்தினை சமப்படுத்த வேண்டும்.
3. பித்தக்குற்றத்தால் பாதிப்படைந்துள்ள வாதத்தினையும் சரிபடுத்த வேண்டும்.
4. வன்மையிழந்த உடற்கட்டுகளை வன்மை அடையச்செய்யும் வகையில் மருந்தளிக்க வேண்டும்.

Line of treatment

Siddha treatment is not only for complete cure but also for prevention and rejuvenation. Saint Thiruvalluvar says about the duty of the physician as follows.

" நோய்நாடி நோய் முதல்நாடி அது தணிக்கும்
வாய்நாடி வாய்ப்பச் செயல்".

-திருக்குறள்.

From the above verse, it is essential to know the aetiology of the disease, the nature of patients, severity of the illness, the seasons and the time of occurrence the disease and the treatment of the disease must be observed clearly. Line of treatment is as follows

1. Kaappu(Prevention)
2. Neekkam(Treatment)
3. Niraivu(Restoration)

1. Kaappu (Prevention)

Prevention is the main aims of siddha system. Siddhars have described general preventive measures and special measures.

Especially in Balavagadam, special preventive measures are explained for prevention of the diseases of the child. It starts from the conception and goes on as the child grows in intrauterine life and after delivery.ie, diet of pregnant women, habit, medicine to take during every month of pregnancy, psychological and environmental conditions.

2. Neekkam (Treatment)

The aim of treatment is based on

To bring the three thodams into normal equilibrium state.

To treat the patients according to the symptoms with internal medicine KURUVER KUDINEER.

1) Anupanam in siddha system

‘‘அனுபானத்தாலே யவிழ்தம் பலிக்கும்
இனிதான சுக்கு கன்னல் இஞ்சி – பினுமுதகால்
கோமேயம் பால் முலைப்பால் கோநெய் தேன் வெற்றிலை நீர்
ஆமிதை யாராய்ந்து செய்யலாம்”.

- தேரையர் வெண்பா.

Siddha system considers anupanam as an important factor. It is otherwise known as “Thunai marunthu”, it can be termed as vehicle, adjuvant and supporting to drug therapy. Without anupanam, sureness in the treatment is mostly not possible. In mantha sanni, Palm Jaggery is anupanam.

2) Pathiyam:

During the course of treatment, the patients were advised to follow certain restrictions regarding diet and physical activities.

This type of medical advice termed as pathiyam, Importance of pathiyam is said by Siddhars Theraiyar as follows,

“பத்தியத்தினாலே பலனுண்டாகும் மருந்து
பத்தியங்கள் போனால் பலன் போகும் - பத்தியத்தில்
பத்தியமே வெற்றிதரும் பண்டிதர்க்கு ஆதலினால்
பத்தியமே உத்தியென்று பார்”.

-தேரையர் வெண்பா.

The patient with mantha sanni is advised to avoid gluten, casein food, night shade vegetables, sweets, creamy items, cool drinks, cold water and exposure to chill weather and allergens.

3) Niraivu: (restoration)

Resonance of disease recovery was given to all patients.

All the patients are advised to prepare for lifestyle changes that provide a disease free life

i)Diet

Siddhars advise the diet regiments for patients. They are explained below,

“ கத்தரிபேய்புடல் வரையிருபாகல் பருங்காளா கண்டகாரி
அத்திக்காய்களும் வருக்கைமாபயற்றை கரையால் பீர்க்கரும் - பிஞ்சுவேர்
மொய்த்தசூரணங் கதலித் தண்டுகளைப் பூமுளங்கி முருக்கரும்பும்

அத்திப்பூசணிக் காயருள்ளி வள்ளியுங் கபத்தோர்க் காணாமே ."

- பதார்த்த குண சிந்தாமணி.

‘‘ வேளை மணத்தக்காளி மென்சீதை சக்கரவர்த்தி
பீளை வசலை சுக்கு பெண்சணங்கள்-வேளையில்
செந்தளிர் களைக்கீரை செய்வர் கபதேகர்நிதம்
வந்தளியுணத்தான் மகிழ்ந்து’’.

-பதார்த்த குண சிந்தாமணி.

காய்கறிகள்

கத்தரி, பேய்புடல், அவரை, கண்டங்கத்தரி, அத்திக்காய், பீர்க்கு, வாழைத்தண்டு, முருங்கை, பாகல், பூசணி இவைகளை தவிர்க்கவும்.

வேர்கிழங்குகள்

முள்ளங்கி, ஈருள்ளி இவைகளை தவிர்க்கவும்.

கீரைகள்

மணத்தக்காளி, சிறுகண்பீளை, வசலை, சிறுகீரை, பொன்னாங்கண்ணி, சக்கரவர்த்திகீரை, சுக்குகீரை ஆகியவைகளை உணவில் சேர்த்துக்கொள்ள வேண்டும்.

ii) Diet restrictions

Siddhars advised to avoid certain food items during diseased conditions.

They are,

“கடுகு நற்றிலத் தெண்ணெய் கூழ்பாண்டங் கடலை
வடுவதாகிய தெங்குமா வருக்கை நற்காய
மடுவி லாதவெள் ளுள்ளுகொள் புகையிலை
மதுபெண் இடறுபாகவே பகத்தி நீர்கடலிச் சாபத்

-பதார்த்த குணசிந்தாமணி

Prevention Methods

The patients were advised to find out which avoid them,

Avoid Gluten and casein food products

Avoid chill and cold weather

Avoid cool drinks and ice creams.

Avoid contaminated food and water.

Take highly nutritious diet to get their immunity developed.

3.2. MODERN ASPECTS

Autism Spectrum Disorder

In early 1900's Autism has referred to the range of neuropsychological conditions.Individuals with autism are generally withdrawn from social and emotional interaction giving rise to the term. Autism is an umbrella term for Autism spectrum disorder which is charscterised by Constant problem with social communication and interactions across a variety of contexts such as Early onset of symptoms (typically in the first two years of life), Repetitive, restricted patterns of behaviour, Activities and interests, Symptoms that cause major impairment in social, educational and other important area of functioning. It is called a spectrum because of the wide range of symptoms and impairment level in children can have. Some are only mildly affected by their symptoms, while the other children are severely disabled [11]

The Basis of ASD:

1. **Genetic factors:** may be the most significant cause for ASD spectrum disorders. Early studies of twins had estimated heritability to be over 90%, meaning that genetics explains over 90% of whether a child will develop ASD.
2. **A common hypothesis:** is that ASD is caused by the interaction of a genetic predisposition and an early environmental insult. Several theories based on environmental factors have been proposed to address the remaining risk.
3. **Epigenetic:** mechanisms may increase the risk of ASD. Epigenetic changes occur as a result not of DNA sequence changes but of chromosomal histone modification or modification of the DNA bases.
4. **Prenatal environment:** The risk of ASD is associated with several prenatal risk factors, including advanced age in parent, diabetes, bleeding, and use of psychiatric drugs in the mother during pregnancy.
5. **Infectious processes:** Prenatal viral infection has been called the principal non genetic cause of ASD. Prenatal exposure to rubella or cytomegalovirus activates the mother's immune response and greatly increases the risk for ASD.
6. **Teratogens:** are environmental agents that cause birth defects. Some agents that are theorized to cause birth defects have also been suggested as potential ASD risk factors.
7. **Thyroid problems**: that lead to thyroxin deficiency in the mother in weeks 8–12 of pregnancy have been postulated to produce changes in the foetal brain leading to ASD.

Thyroxin deficiencies can be caused by inadequate iodine in the diet, and by environmental agents that interfere with iodine uptake or act against thyroid hormones.

8. **Diabetes in the mother**: during pregnancy is a significant risk factor for ASD; a 2009 meta-analysis found that gestational diabetes was associated with a twofoldincreased risk.
9. **Locus coeruleus–noradrenergic system**: This theory hypothesizes that autistic behaviours depend at least in part on a developmental deregulation that results in impaired function of the locus coeruleus–noradrenergic (LC-NA) system.
10. **Amygdala neurons**: This theory hypothesizes that an early developmental failure involving the amygdala cascades on the development of cortical areas that mediate social perception in the visual domain [11].

Symptoms of ASD [12]

The signs and symptoms of autism spectrum disorder vary widely, as do its effects. Some autistic children have only mild impairments, while others have more obstacles to overcome. However, every child on the autism spectrum has problems, at least to some degree, in the following three areas:

1. Communicating verbally and non-verbally.
2. Relating to others and the world around them.
3. Thinking and behaving flexibly.
4. Some children with autism spectrum disorders start to develop communication skills and then regress, usually between 12 and 24 months. This should be taken very seriously, as regression is a major red flag for autism.

Diagnosis of ASD:

Monitor your child's development: Autism spectrum disorder (ASD) involves a variety of developmental delays (social, emotional, and cognitive).

Take action if you're concerned: Every child develops at a different pace, but if your child is not meeting the milestones for his or her age, or you suspect a problem, share it with your doctor.

Don't accept a wait-and-see approach. Waiting is the worst thing you can do. You risk losing valuable time at an age where your child has the best chance for improvement.

Trust your instincts. Sometimes, even well-meaning doctors miss red flags or underestimate problems. Listen to your gut if it's telling you something is wrong, and be persistent.

Early Signs of Autism in Babies and Toddlers (0-18 months):

Inability to relate to other children or adults
Poor speech or Lack of speech
Inappropriate laughter or crying
Oversensitive or under sensitive to sound
Inappropriate playing with toys
Difficulty dealing with changes in routine
Oversensitive or under sensitive to touch

The Following Delays Warrant an Immediate Evaluation By Your Child's Paediatrician:

By 6 months: No big smiles or other warm, joyful expressions.
By 9 months: No back-and-forth sharing of sounds, smiles, or other facial expressions.
By 12 months: Lack of response to name, No babbling or "baby talk", No back-and-forth Gestures, such as pointing, showing, reaching, or waving.
By 16 months: No spoken words.
By 24 months: No meaningful two-word phrases that don't involve imitating or repeating.

Signs and Symptoms of Social Difficulties in ASD:

Appears disinterested or unaware of other people or what's going on around them.
Doesn't know how to connect with others, play, or make friends.
Prefers not to be touched, held, or cuddled.
Doesn't play "pretend" games, engage in group games, imitate others, or use toys in creative ways.
Has trouble understanding or talking about feelings.
Doesn't seem to hear when others talk to him or her.
Doesn't share interests or achievements with others (drawings, toys).
Basic social interaction can be difficult for children with autism spectrum disorders. Many kids on the autism spectrum seem to prefer to live in their own world, aloof and detached from others.

Common Self-Stimulatory Behaviours:

1. Hand flapping.
2. Rocking back and forth.
3. Spinning in a circle.
4. Finger flicking.
5. Head banging.
6. Staring at lights.
7. Moving fingers in front of the eyes.
8. Flicking light switches on and off.
9. Repeating words or noises.

Educational Interventions [13]:

1. Applied Behavioural Analysis (ABA): works to systematically change behaviour based on principles of learning derived from behavioural psychology and encourages positive behaviour as well teaching new skills.

2. Speech Therapy: with a licensed speech-language pathologist is important in helping to improve a person's communication skills, allowing better expression. Some individuals with ASD are nonverbal, so the use of gestures and sign language are useful.

3. Occupational Therapy (OT): used as a treatment for the sensory integration issues associated with ASDs. Improves the individual's quality of life and ability to participate fully in daily activities.

4. Physical Therapy (PT): to improve gross motor skills and handle sensory integration issues, particularly those involving the individual's ability to feel and be aware of his body in space.

Medical Management [13]:

1. Pharmaceutical treatments can help ameliorate some of the behavioural symptoms of ASD, including irritability and aggression such as, Risperidone and Aripriprazole.
2. Medications should be prescribed and monitored by a qualified physician. However, medications may have adverse effects.

3. Stem cell therapy is a new effective approach to treating ASD and is based on the unique ability of stem cells to influence metabolism, immune system and restore damaged cells.

Stem Cell Therapy Targets Several Aspects of Concern:

1. Immunity.
2. Metabolism.
3. Communication ability.
4. Learning capacity, memory, and thinking.

Improvement is reached through restoration of the lost (impaired) neuron connections and formation of the new neuron connections, speeding up brain reactions through improvement of synaptic transmission and development of the new neuron connections.

Improvements in ASD after the Stem Cell Therapy [13]:

1. Better tolerance of different foods and improved digestion.
2. Easier contact with the child (first of all, eye contact).
3. More adequate behaviour at home and outside.
4. Less or no fear of loud noises, strangers and bright colours (gradual improvement).
5. Improved verbal skills.
6. Writing skills improvement or development.
7. Improved self-care skills.
8. Improved attention span and concentration.

3.3. REVIEW OF DRUG LITERATURE

3.3.1. Vettiveria zizanoides. (Linn)Nash (வெட்டிவேர்)[15]

Vettiveria zizanoides .(Linn)Nash (Family : Poaceae) is known as வெட்டிவேர் (அ) குருவேர் and commonly Known as Cuscus grass, Khas- khas, Khus-Khus .The Holy herb Vettiver is derived from Vettivert in Reunioun Island . It has been Introduced from India through Indonesia .Its name etched the Bhagavat Gita as the Hindu holy book where lord Krishna says " I am the fragrance of soil" [18] .Vettiver grows wild and found in India.It is also distributed in Mysore, Chottanagapur, Bay of Bengal, Rajput and throughout the tropical and sub-tropical plains[19]. Vettiver is a fast growing perineal herb and can grow upto 150cm height. The Leaves are long, thin and rigid. The stems are tall, erect and stiff. The flowers are brownish purple colour. This aromatic tuft grasses are spreading horizontally. It has a Mat like root system and grows downward 2m to 4m in depth [20]. This grass has no stolen nor rhizomes. Above all the characteristics, it is highly drought tolerant which protect the soil against sheet erosion [21].

Chemical Constituents:

The major chemical constituents in vettiver oil are alpha and beta vetivones, vetivenol and vetivenyl vetivenate. The powdered fresh roots on extraction with petroleum ether yield khusino, isokhushinol, khushinic acid and epikhusenic acid [22].

பித்தவி தாகம் சகிகா மிலங்கறைப் பித்தமனற்
றத்திடு குட்டஞ் சிரநோய் களமடி தாதுநட்ட
மத்தம னற்புண் டனப்புண்வன் மூர்ச்சை வரிவிழிநோய்
வித்திர மேகத்தின் கட்டியும் போம் வெட்டி வேரினுக்கே[14].

சுவை: இனிப்பு , **தன்மை:** தட்பம் **பிரிவு:** இனிப்பு
செய்கை: உரமாக்கி, வெப்பமுண்டாக்கி, இசிவகற்றி, வியர்வைப்பெருக்கி, சிறுநீர்பெருக்கி, ருதுவுண்டாக்கி, வெப்பகற்றி,

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of vettiver are Evaluation of Antioxidant Activity (Hyun-Jin Kim) [23], Hepatoprotective activity (Suaib Luqman) [24], Anti tuberculosis activity (D Saikia) [23].

Recent researches of Vetiveria zizanoides

Jha Prajna et al., HPLC Quantification of Phenolic Acids from Vetiveria zizanioides (L.) Nash and Its Antioxidant and Antimicrobial Activity. Extraction procedure was standardized and for the soluble, glycoside, and wall-bound fractions of phenolic acids from Vetiveria zizanioides. The compounds p-coumaric acid, p-dihydroxybenzoic acid, and ferulic acid were detected in the acidic extracts by HPLC analysis. Dania Cheaha et al., Modification of sleep-waking and electroencephalogram induced by vetiver essential oil inhalation Essential oils (EOs) have been claimed to modulate mental functions though the most of data were obtained from subjective methods of assessment. Direct effects of EO on brain function remained largely to be confirmed with scientific proof [25].

3.3.2. Plectranthus vettiviroides (Jacob) Singh &Sharma- விலாமிச்சு [15].

Plectranthus vettiviroides (Family: Lamiaceae) is Know as **விலாமிச்சு** and commonly known as White cus cus grass. The Etymology of word Cus cus grass which is derived from Sanskrit name Hrivera. It is distributed in endemic to South India and now it is extinct in the wild. It has been seen only under cultivation at Shiyali, Tanjore district, Palani in Madura district Canjeevaram in Chengalpattu district etc. It is a aromatic grass usually grows in the flower garden [26]. The Leaves are long, thin and rigid. The stems are tall, erect and stiff. The flowers are brownish purple colour. This aromatic tuft grasses are spreading horizontally. It has a Mat like root system and grows downward 2m to 4m in depth.

Chemical Constituents:

The Major chemical consituents of White cus cus grass are carbohydrates, steroids, proteins, amino acids, phenolic compounds, tannins and alkaloids in various extracts [27].

மேகம் விழியெரிச்சல் வீறிரத்த பித்தமொடு
தூகமத மூர்ச்சைபித்தந் தன்மயக்கம்- சோகஞ்
சிரநோய் இவையேகுஞ் செய்யவிலா மிச்சுக்
கெரிசுரமும் இல்லை யிசை. [14].

சுவை: கைப்பு , **தன்மை:** தட்பம் **பிரிவு**:இனிப்பு
செய்கை: குளிர்ச்சியுண்டாக்கி, பித்தமடக்கி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the White cus cus grass are Anti oxidant activities (Nisheeda), Analgesic (Hussain), Cns Depressants (Rehman) [28]..

Recent researches of Plectranthus vettiveroides:

Subdra ganapathy et. al., The efficacy of Plectranthus vettiveroides against various cancer cell lines showed that the incubation of cancer cells reduced the viability of all cancer cell lines and the dead cells were significantly increased with high extract concentration. Hence hydro alcoholic extract of Plectranthus vettiveroides exhibited high cytotoxicity. Also the extract showed potent antioxidant activity against all the three tested methods. Even at very low concentration Plectranthus vettiveroides showed high efficacy. In conclusion Plectranthus vettiveroides possess significant antioxidant activity and anticancer activity [29].

3.3.3. Zingiber officinalae (சுக்கு) [15]

Zingiber officinalae (Family: Zingiberaceae) is known as chukka and commonly known as dry ginger. The Etymology of the word Ginger comes from old French (Gingibre), Sanskrit (Sringavera: Sringa- Horn, Vera – body or Root) and was altered to Latin Gingiber, in Greek it is zingeberries [30]. The Nativity of Ginger was Southern Asia and quite popular in Carribean Island. In this Island, It is called as Jamaican Ginger and it is the world most supplier followed by India, Africa and China [31].It is a flowering plant and slender perennial herb which is usually annually grows. It is undergroundstem and thickened branched rhizome. It grows in both tropical and sub tropical regions [32].

Chemical Constituents:

The chemical constituents are zingiberene, β-bisabolene, α-farnesne, β-sesquiphellandrene, monoterpene hydrocarbons which are α-curcumene and phenolic compounds which are gingerol and shogaol in methanol and n-hexane respectively [33].

சூலைமந்தம் நெஞ்செரிப்பு தோடமேப் பம்மழலை
மூலம் இரைப்பிருமல் மூக்குநீர்- வாலகப
தோடமதி சாரந் தொடர்வாத குன்மநீர்த்
தோடம்ஆ மம்போக்குஞ் சுக்கு[14]..

சுவை: கார்ப்பு , **தன்மை:** வெப்பம் **பிரிவு:** கார்ப்பு
செய்கை: வெப்பமுண்டாக்கி, அகட்டுவாய்வகற்றி, பசித்தீதூண்டி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the dried Ginger plants are Antioxidant activity (Stoilova) [34] , Anxiolytic activity (Vishwakarma) [35], CNS depressant activity (Kim cooper) [36], selective serotonin reuptake inhibitors (SSRIs) (Chopra) [37].

Recent researches of Zingiber officinalae:

Buldun et.al; the main pharmacological actions of ginger and compounds isolated therefrom include immuno-modulatory, anti-tumorigenic, anti-inflammatory, anti-apoptotic, anti-hyperglycemic, anti-lipidemic and anti-emetic actions [38]. Ginger is a strong anti-oxidant substance and may either mitigate or prevent generation of free radicals. It is considered a safe herbal medicine with only few and insignificant adverse/side effects. More studies are required in animals and humans on the kinetics of ginger and its constituents and on the effects of their consumption over a long period of time [39]. Wilson et.al, Limited data suggest that ginger may accelerate recovery of maximal strength after eccentric resistance exercise and reduce the inflammatory response to cardiorespiratory exercise. Major limitations to the research include the use of untrained individuals, insufficient reporting on adverse events, and no direct comparisons with NSAID ingestion. While ginger taken over 1–2 weeks may reduce pain from eccentric resistance exercise and prolonged running, more research is needed to evaluate its safety and efficacy as an analgesic for a wide range of athletic endeavours [40] .

3.3.4. Hedyotis corymbosa (Linn.) Lam – பற்பாடகம் [15]

Hedyotis corymbosa (Family: Rubiacea) is known as பற்பாடகம் (அ) சீதம் and commonly known as Fever plant and parpat. The Etymology of word Heyotis plant which is derived from two Greek. Hedys “Sweet” and Otos “Ear” [41]. It was frequently occurs in cultivated fields and waste places in sandy oil. It is widely naturalized weed through the tropics and subtropics regions [42]. It is widespread through Africa, Arabia, and Asia to new guniea. It grows as erect plant and slightly branched and measures 20 to 40 cm high.The stem is full and slender. The leaves are simple, opposite and decussate.The flowers are solitary and the seeds are conical, black in colour [43].

Chemical Constituents:

The chemical constituents are ten compounds have been isolated and elucidated as geniposide, 6 alpha-hydroxygeniposide, scandoside methyl ester (6 beta-hydroxygeniposide), asperulosidic acid, deacetylasperuloside, asperuloside, 10-O-benzoylscandoside methyl ester, 10-O-p-hydroxybenzoyl scandosidemethyl ester, lyoniresinol-3 alpha-O-beta-glucopyranoside, and rutin [44].

சீதவா தச்சுரமுவ் தீராத தாகமும்போம்
போதவிரு கண்குளிரும் பொய்யலவே – புதலத்துள்
வற்பார் பயித்தியமு மாபித்த முந்தொலையும்
பற்பாட கத்தையுன்னிப்(பார்) [14]

சுவை: கைப்பு , **தன்மை:** வெப்பம் **பிரிவு:** கார்ப்பு

செய்கை: மலமிளக்கி, பசித்தீதூண்டி , அழுகலகற்றி, வெப்பகற்றி, வியர்வைப்பெருக்கி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the Parpat plant are Antioxidant (Senthamil Selvan) [46], Antimicrobial (Zahir Hussain) [47], Anti depressant activity (Anil T Pawar) [47], Hepatoprotective (Gajakosh) [47].

Recent researches of Hedyotis corymbosa:

Jagathala Mahalingam Sasikumar et, al., the methanolic extract of the aerial part of Hedyotis corymbosa (L.) Lam. (Rubiaceae) was screened for antioxidant activity using 1,1-diphenyl-2-picryl hydroxyl (DPPH) quenching assay, 2,2'-azinobis-3-ethylbenzothiozoline-6-sulfonic acid (ABTS) cation decolorization test, ferric reducing power (FRP), scavenging capacity towards hydroxyl ion (OH*) radicals and nitric oxide (NO) radical inhibition activity using established assay procedures. Total phenolics and total flavonoid contents were also determined [48]. Susi Endrini et, al., the research was conducted to determine the anticarcinogenic properties of “rumput mutiara” (Hedyotis corymbosa (L.) Lam) and “pohpohan” (Pilea trinervia (Roxb.) Wight), By the microculture tetrazolium salt (MTT) assay on the human breast carcinoma dependent-hormone (MCF-7) cell lines. The preliminary results showed that the “rumput mutiara” extract displayed the cytotoxic effects against MCF-7 with IC50-value of 22, 67 µg/ml. However, the “pohpohan” extract did not show the IC50- value against MCF-7 cell lines. The antioxidative activities of the extracts which could contribute to their cytotoxic properties were also studied. The “rumput mutiara” extract was found to have higher antioxidant activity compared with “pohpohan” extract. The

strong cytotoxic properties of the "rumput mutiara" extract could be due to its high antioxidant activity [49].

3.3.5. Clerodendrum serratum (Linn) Moon (சிறுதேக்கு) [15]

Clerodendrum serratum (Family: Verbenaceae) is known as சிறுதேக்கு (m) கண்டுபாரங்கி and commonly known as beetle killer, blue flowered glory tree and blue fountain bush in English and barangi in Sanskrit (Barangi means glorious) [50] . It is a woody shrub with blunty quadrangular stems and branched. Flowers are blue in colour. So it is called blue flowered glory tree[51] .The Native of Bettle Killer are tropical and warm temperate regions of East India and Malasia. Also distributed throughout in forest of Srilanka and India [52].

Chemical Constituents:

The major Chemical Constituents are Glucose, D-Mannitol, Hydrolysis of crude saponin, Oleanic acid, queretaroic acid, Serratagennic acid, B-Sitostirol and phytosterol [53]

காச சுவாசங் கதித்தஷய மந்தமனல்
வீசுசுரஞ் சன்னி விளைதோடம்- ஆசுறுங்கால்
இத்தனையு ணிற்கா எரிகாஞ் சேர்க்கண்டங்
கத்திரியுண் டாமாகிற் காண் [14]

சுவை: கார்ப்பு, **தன்மை:** வெப்பம் **பிரிவு:** கார்ப்பு
செய்கை: கோழையகற்றி, சிறுநீர்பெருக்கி, அகட்டுவாய்வகற்றி.

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of Bettle Killer plants are Inhibition of serotonin activity (Ismail shareef), Wound healing Activity (Vidhya), Anticarcinogenic activity (Prasant kumar),Bronchodialator activity (Praveen kumar) [54] , Antiulcer activity(AnilGupta), Reduction of pschycological stress (Manoj sarma), Antioxidant (Bhujibal SS), CNS depressant (Kajaria divya), Antidiabetic (Trupti R Swain),Vasorelaxant (Mihor K Kar) [55].

Recent researches of Clerodendrum serratum:

Kajaria D K et al. The studies on steroidal and anti- platelet aggregation factor were performed in Swiss albino rats. Finally Bharangyadi compound has no endogenous steroidogenesis effect. It has any role in platelet aggregation inhibition. There is no significant change in the weight of adrenal gland with the drug after two week treatment; it concluded that the anti-inflammatory effect of the Bharangyadi compound is not due to increase synthesis of steroids [56]. Thalla et al., Mast Cell Stabilization the disruption of mast cells of the rat mesentery due to the Saponin and the maximum effect was formed in thirty minutes [57] .Gupta AK et al., The Clerodendrum serratuam alcoholic root extract of 100 and200 mg/kg shows antiasthamatic activity used in ovalbumin lured experimental mice. Due to cyclooxygenase inhibitors, the antiasthamatic activity is acting through inhibition of inflammatory mediators like histamine, serotonin and prostaglandins [57] .

3.3.6. Styrax benzoin – சாம்பிராணி[15]

Styrax benzoin (Styraceae) is known as சாம்பிராணி, பெண் குமைஞ்சான், தூபம், மலாக்காச் சாம்பிராணி and commonly known as gum benzoin, Benzoin, Indian olibanum tree. The Benzoin is obtained from the tree of Indonesia from middle French benzoin whichcomes via Spanish, portuguse, Arabic luban jawi “Incense of jawa” It is grown on the tropical island of Sumatra [58] . It is shruby, deciduous tree, gray bark, simple leaves and short raceme of fragrance, bell shaped white flowers. This tree produces a yellowish, balsamic resin called benzoin or gum Benjamin [59].

Chemical Constituents:

The chemical constituents of Benzoin are23% free balsamic acids contains mainly cinnamic acid, 70-80% resin consisting triterpenoids acid, Siaresinolic acid and Sumaresinolic acid at hydroxyl group. Vanillin, Sterol, and phenyl propyl cinnamita responsible for the aromatic smell [60].

வாதசீ தங்கண்ணோய் மாறாத் தலைவலியும்
ஓதமுறு பீனசமும் ஓட்டுங்காண்- புதலத்தில்
வேம்பிதுதான் என்ன மிகுகசப்பை வாய்க்களிக்கும்
சாம்பிராணி என்னும் சரக்கு[14]

சுவை: கார்ப்பு **தன்மை:** வெப்பம் **பிரிவு:** கார்ப்பு
செய்கை: வெப்பமுண்டாக்கி,கோழையகற்றி, தடிப்புண்டாக்கி, சிறுநீர்ப்பெருக்கி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the Antifungal, Antibacterial (Patrícia M) [61], Antioxidant (Ragav same) [62] , and Antidepressant (Sahif) [63] .

Recent Researches of Styrax benzoin

Pauline Burger et, al., the phytochemical characterisation of both the volatile and non-volatile fractions of benzoin balsams and the quantitation of some of the major components by gas and liquid chromatography techniques. Four coniferyl and two morinol derivatives were characterised for the first time in Benzoe tonkinensis Laos. Finally, two liquid chromatographic methods used to easily discriminate Siam from Sumatra balsam (also known as Benzoe sumatranus Indonesia) were developed [64]. Seema et, al., α-Hydroxyketones were prepared in appreciable yields at a very high speed, (by the benzoin condensation) under microwave irradiation using a catalytic amount of thiamine hydrochloride, from various aromatic as well as heteroaromatic aldehydes. They can be used as intermediates in NCE synthesis [65].

3.3.7. Clatropis gigantea (Linn) - எருக்கு[15]

Clatropis gigantea(Linn)(Family : Asclepedaceae) is known as எருக்கு(அ) அருக்கன் and commonly known as crown flower, Mudar, Gigantic, Swallow wort.In Ancient times, it is a poisonous plant and used as a It is used as an arrow poison, cattle poison , rarely for suicide and homicide and mostly an accidental poison[66] . It is native to Cambodia, Indonesia, Malaysia, the Philippines, Thailand, Sri Lanka, India, China, Pakistan, Nepal, Booc Booc in Somalia and tropical Africa [67]. It is a fast-growing, attractive, evergreen flowering shrub or small tree that grows about 5 metres tall, occasionally to 10 metres. It is much branched at the base, with stems up to 20cm in diameter.

Chemical Constituents:

The Chemical constituents are methyl β-carboline-1-carboxylate dehydrovomifoliol, pleurone, calotropagenin, and calotoxin [68]

வேள்ளெருக் கின்புற வேருமிப் படிசெய்து
கோள்ளவே விருச்சிகக் கூட்டமாந் தேட்குல
முனைத்தினுக் குங்கொடுத் தருளலா முண்மையே[14]

சுவை: கைப்பு, கார்ப்பு, இனிப்பு, **தன்மை:** வெப்பம் **பிரிவு:** கார்ப்பு
செய்கை: வெப்பமுண்டாக்கி, வியர்வைபெருக்கி, உடற்றேற்றி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the Antibacterial Activity (Kalpesh B. Ishnava) [69], Antimicrobial activity (Nagy Mahmoud Morsy) [70], Antioxidant (Namrata Singh) [71] and anxiolytic activity (Irfan Newaz Khan) [72]

Recent researches of Calatropis giganteae:

Irfan Newaz Khan et, al., the crude ethanolic extract exhibited a significant decrease of motor activity and exploratory behavior in whole cross and open field tests. The extract also markedly increased both the number of visits to and time spent in the corners of the open field. The extract treated rats spent more time in the open arm of elevated plus-maze, showing its antianxiety activity. There was a decrease in the locomotor activity. Namrata Singh et, al., Antioxidants play an important role to protect human against infections and degenerative diseases. The aim of this study is to verify the In-vitro antioxidant properties and to calculate the total polyphenol contents, total tannins, and flavonoid contants of hydroalcohlic extract. The powdered crude drugs were extracted with hydro-alcoholic solvent (70:30) by double maceration process. Phytochemical tests of hydro-alcoholic extract reveal the presence of carbohydrate, alkaloid, flavonoid, steroids, protein, amino-acids and tannins. It is concluded that, this study is to verify the antioxidant properties of hydroalcohlic extract, and to define the total polyphenol contents, flavonoids and tannins in Calotropis gigantea leaves [72].

3.3.8. Azadiracta indica .A.Jess – வேம்பு[15]

Azadiracta indica (Family; Meliaceae) is also kown as வேம்பு, அரிட்டம், துத்தை நிம்பம், பாரிபத்திரம், வாதாரி, வேப்பு and commonly known as Neem, Indian lilac, Margosa tree. The word Neem comes from Latin and Azadiracta indica which is derived from Persian.

Azad means “Free” and diracta Means “Tree” Hence it literally means “Free tree of India” [73]. It is a fast-growing tree that can reach a height of 15–20 metres (49–66 ft), rarely to 35–40 metres (115–131 ft) [73]. It is evergreen, but in severe drought it may shed most or nearly all of its leaves. The branches are wide and spreading. Typically growing in tropical and semi-tropical regions [74]. Neem trees now also grow in islands in the southern part of Iran. It is considered to be native to dry areas in Afghanistan, Pakistan, India, Sri Lanka, Bangladesh, Myanmar and China. It is cultivated as well as naturalized in Thailand, Malaysia and Indonesia [75].

Chemical Constituents:

The Major chemical constituents are three flavonoids and one flavone glycoside, isomeldenin, nimbin, nimbinene, 6-desacetyllnimbinene, nimbandiol, immobile, nimocinol, quercetin, and beta-sitosterol [76].

கிருமிகுட்ட மாந்தங் கெடுவிடஞ்சு ரங்கள்
பொருமியம் சுரிகையின் புண்கள் - ஒருமிக்க
நிம்பத் திலையிருக்க நீடுலகில் நீங்காமல்
கம்பத் திலையிருக்கக் காண[14].

சுவை: கைப்பு, **தன்மை**: வெப்பம் **பிரிவு:** கார்ப்பு
செய்கை: வெப்பமுண்டாக்கி, புழுக்கொல்லி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the Neem tree are Antimicrobial, Cytotoxic, Analgesic, Anti-Inflammatory (Talha Bin Emran) an antioxidant activity (Sree Lakshmi) [77].

Recent researches of Azadiracta indica

Raj Kumar et, al., Pre-clinical research work done during the last decade has fine-tuned our understanding of the anticancer properties of the crude and purified products from this plant. The anticancer properties of the plant have been studied largely in terms of its preventive, protective, tumor-suppressive, immunomodulatory and apoptotic effects against various types of cancer and their molecular mechanisms. This review aims at scanning scattered literature on “the anticancer biology of A. indica,” related toxicity problems and

future perspectives. The cogent data on the anticancer biology of products from A. indica deserve multi-institutional clinical trials as early as possible. The prospects of relatively cheaper cancer drugs could then be brighter, particularly for the under-privileged cancer patients of the world [78]. Ayon Bhattacharya et, al., The analgesic activity using the Neem Seed Oil (NSO) has already been done but not the Neem Leaf Extract (NLE). Hence the present study is done to evaluate the analgesic effect of NLE on albino rats. It is a randomized control study. The analgesic effect of Neem Leaf Extract (NLE) was assessed by the experimental pain model of tail flick response to thermal stimulation. The results were statistically analyzed by applying the chi-square test .NLE in all doses enhanced the Tail flick Latency (TFL) and showed a dose dependent increase in effect. The Neem Leaf Extract (NLE) exhibited analgesic activity showing its central analgesic action [79]

3.3.9. *Shorea robusta, Gaertn.f.-குங்குலியம்* [15]

Shorea robusta (Family: Dipterocarpaceae) is known as குங்குலியம், குங்கிலிகம்,சருவரசம்,குக்கில் and commonly known as Sal tree. The word sal comes from Sanskrit Ashton (1998). "Shorea robustawhich means house. In Hindu tradition, the sal tree is said to be favoured by Vishnu [80]. It is found in Assam, Nepal, and Bengal and on the bank of the Yamuna River. In Haryana Sal can be found in the Morni Hills and the Kalesar forests. Sal tree grows in North East and Central India up to 1700 meter elevation. It is widely grown in the foothills of the Himalayas. It requires well drained, moist and sandy loam soil. is a large sub deciduous tree. It is up to 30 meter high. Sal tree is seldom completely leafless. It has large leathery leaves and yellowish flowers. They have tough texture. Young trees have a linear crown, which becomes rounder and flatter with aging. The sapwood is whitish in colour, thick and is less durable. The heartwood becomes dark brown to black in colour on exposure. The wood pores are filled with resin [81].

Chemical Constituents:

The chemical constituents have an oleoresin, which contains triterpenoids, the derivatives of ursonic, oleanane and a triterpene acid. These chemical constituents give Sal Tree its therapeutic benefits [82].

பெரும்பாடு மேகம்போம் பேரா துடலில்
அரும்பிய புண் ணாறுமிவை யல்லாமல் - குரும்பாம்
எலும்புருக்கி புண்சீழும் ஏகும் உலகில்
சலம்பருகுங் குங்கிலியத் தால் [14]

சுவை: கைப்பு, கார்ப்பு **தன்மை**: வெப்பம் **பிரிவு:** கார்ப்பு
செய்கை: வெப்பமுண்டாக்கி, கோழையகற்றி, சிறுநீர்பெருக்கி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the sal tree are Anti bacterial, antioxidant (Raphael R. Marandi) [83] ,Anti fungal activity (K. Sri Rama Murthy) [84] , Analgesic activity (Wani TA) [85] and Wound healing activity (Mukherjee.H.) [86].

Recent researches of Shorea robusta:

Sushma Vashishtha et, al., the methanolic extract of the resin of Shorea robusta was subjected to investigate its antioxidant and antibacterial properties its utility in free radical mediated diseases including diabetic, cardiovascular, cancer etc. The methanol extract of the resin was tested for antioxidant activity using scavenging activity of DPPH (1,1-diphenyl-2-picrylhydrazil) radical method, reducing power by FeCl3 and antibacterial activity against gram positive and gram negative bacteria using disc diffusion method. The phytochemical screening considered the presence of triterpenoids, tannins and flavoniods. Overall, the plant extract is a source of natural antioxidants which might be helpful in preventing the progress of various oxidative stress mediated diseases including aging. The half inhibition concentration (IC50) of resin extract of Shorea robusta and ascorbic acid were 35.60 µg/ml and 31.91 µg/ml respectively. The resin extract exhibit a significant dose dependent inhibition of DPPH activity. Antibacterial activity was observed against gram positive and gram negative bacteria in dose dependent manner [87]. Chattopadhyay Debprasad et,al., to evaluate the anti-inflammatory and analgesic activities and the possible mechanism of action of tender leaf extracts of Shorea robusta, traditionally used in ailments related to inflammation. The acetic-acid-induced writhing and tail flick tests were carried out for analgesic activity, while the anti-inflammatory activity was evaluated in carrageenan-and dextran- induced paw edema and cotton-pellet-induced granuloma model. The acetic-acid-induced vascular permeability, erythrocyte membrane stabilization, release of proinflammatory mediators (nitric oxide and prostaglandin E2), and cytokines (tumor necrosis factor-α, and interleukins-1β and -6) from lipopolysaccharide-stimulated human monocytic cell lines were assessed to understand the mechanism of action. The results revealed that both aqueous and methanol extract (400 mg/kg) caused significant reduction of writhing and tail flick, paw oedema, granuloma tissue formation, vascular permeability, and

membrane stabilization. Interestingly, the aqueous extract at 40 µg/mL significantly inhibited the production of NO and release of PGE2, TNF-α, IL-1β, and IL-6. Chemically the extract contains flavonoids and triterpenes and toxicity study showed that the extract is safe. Thus, our study validated the scientific rationale of ethnomedicinal use of S. robusta and unveils its mechanism of action. However, chronic toxicological studies with active constituents are needed before its use [88].

3.3.10. Aquillaria agallocha Roxb- அகிற்கட்டை[15]

Aquillaria agallocha (Family: Thymelaeaceae) is known as அகிற்கட்டை (அ) காகதுண்டம் and commonly known as Aloe tree, Eagle tree and Sweet scented tree. The Etymology of word Aloe tree which is derived from Sanskrit name Aguru. It was popular in Rome, Greece, Arabia, Persia, Egypt, India, and China in ancient times. At first it was used in embalming and many historical records continues to use in some Middle Eastern areas such as Yemen. Some numerous Islamic text references shows about Aloe tree [89]. The habitats of Aloe wood tree are humid, subtropical climate with rainfall 1800-3500 mm annually. They are distributed in Himalayan mountain region, Assam, Butan, Asia [90].

Chemical Constituents:

The chemical constituents are aquilochin, liriodenine (an alkaloid), agarol (novel sesquiterpenes), chromone derivatives (Agarospirol) and the essential oils yields a number of agarofurans, sesquiterpene alcohols and spirosesquiterpene alcohols [91].

நூசி யடைப்பு நவிரவிடி தாளுநோய்
வீசு நமைப்புடைப்புகள் விட்டேகும்- பேசில்
சுகரு மயங்குந் துணைமுலையாய் நல்ல
அகரு மரத்தா லறி[14]

சுவை: கைப்பு, கார்ப்பு,சிறு இனிப்பு , **தன்மை**: வெப்பம் **பிரிவு:** இனிப்பு
செய்கை: வெப்பமுண்டாக்கி, பித்தநீர்ப்பெருக்கி, வீக்கமுருக்கி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the Aloe tree had Antispasmodic, Antiemetic, Constipative, Stomachic, Sedative, Tonic, nutritive, tissue-builder .

Recent Researches of Aquillaria acallocha

P.B. Miniyar et, al., Traditionally, the bark, root and heartwood are used for their medicinal properties as a folk medicine to treat infl ammation, arthritis, vomiting, cardiac disorders, cough, asthma, leprosy, anorexia, headache and gout. Th e present study was carried out to investigate the antioxidant activity of ethyl acetate extract of Aquilaria agallocha (EAA). EAA was tested in vitro at diff erent concentrations for inhibitory effect on nitrite-induced oxidation of haemoglobin in human blood haemolysate. Results indicate a strong antioxidant effect of EAA in a concentration range of 500-3500 µg/ml. However pro-oxidant activity was observed at higher concentrations of these compounds. Radik naiyar et,al., studies have shown that agarwood leaves had mild depressant and antioxidant actions. We, therefore, interested in screening the actions of Aquilaria subintegra (AS) leaves extract on the central nervous system (CNS) function and learning and memory in an animal model of Alzheimer's disease. Sixty aged female rats were used. Fifty rats were subjected to bilateral ovariectomy and ten rats were served as control sham. These rats were divided into 5 groups as 1) control 2) sham (non-ovariectomized) .After a single dose administration, rats were subjected to behavioral tests. We found that the AS-treated groups exhibited 1) a reduction in spontaneous locomotion, 2) an increase of anxiolytic index, 3) an increase of nociceptive threshold, and 4) marked potentiation of thiopental induced anesthesia. Additionally, rats received AS leaves extract for 2 months showed a significant improvement in both object recognition and spatial memories when compared to the control group. Altogether, the results suggest that agarwood leaves extract has the potential to be developed as herbal beverage and may be used for reducing stress and anxiety, and for the treatment of mild cognitive deficits [92] .

3.3.11 .Nigella sativa .Linn – கருஞ்சீரகம் (அ) சந்நி நாயகம் [15]

Nigella sativa (Family: Ranunculaceae) is also known as கருஞ்சீரகம், அரணம், உபகுஞ்சிகை, சந்நி நாயகம் and commonly known as Black cumin, small fennel seeds. The Etymology of nigella contains an element meaning black in reference to the unusually dark colour of the seeds. It was robably Western Asia. Although nigella is not mentioned in the common Bible translations, there is good evidence that an obscure plant name mentioned in the Old Testament means nigella; if true, this would indicate that nigella is cultivated since far more than two millennia [93]. It is an annual flowering plant, native to south and southwest Asia. It grows to 20–30 cm (7.9–11.8 in) tall, with finely divided, linear (but not thread-like) leaves. The flowers are delicate, and usually coloured pale blue and white, with five to ten

petals. The fruit is a large and inflated capsule composed of three to seven united follicles, each containing numerous seeds which are used as spice, sometimes as a replacement for original black cumin [94].

Chemical Constituents:

The major Chemical Constituents of seeds contain numerous esters of structurally unusual unsaturated fatty acids with terpene alcohols (7%); furthermore, traces of alkaloids are found which belong to two different types: iso-chinoline al-kaloids are repre-sented by nigellimin and nigellimin-N-oxide, and pyrazol alkaloids include nigellidin and nigellicin. In the essential oil thymo-quinone was identified as the main component besides p-cymene, α-pinene, di-thymo-quinone and thymo-hydroquinone. Other terpene derivatives were found only in trace amounts: Carvacrol, carvone, limonene, 4-terpineol, and citronellol. Further-more, the essential oil contains significant (10%) amounts of fatty acid ethyl esters. On storage, thymo-quinone yields di-thymo-quinone and higher oligo-condensation products (nigellone). The seeds also contain a fixed oil rich in unsaturated fatty acids, mainly linoleic acid (50 – 60%), oleic acid (20%), eicodadienoic acid (3%) and dihomo-linoleic acid (10%) which is charac-teristic for the genus. Saturated fatty acids (palmitic, stearic acid) amount to about 30% or less. Commercial nigella oil (Black Seed Oil, Black Cumin Oil) may also contain parts of the essential oil, mostly thymo-quinone, by which it acquires an aromatic flavour [95].

கருஞ்சீ ரகத்தான் கரப்பனொடு புண்ணும்
வருஞ்சீராய்ப் பீநசமு மாற்றும் - அருந்தினால்
காய்ச்சல் தலைவலியுங் கண்வலியும் போமுலகில்
வாய்ச்ச மருந்தெனவே வை[14] .

சுவை: கைப்பு, **தன்மை:** வெப்பம் **பிரிவு:** கார்ப்பு
செய்கை: அகட்டுவாயகற்றி, சிறுநீர்பெருக்கி, ருதுவுண்டாக்கி, பசித்தீதூண்டி, பாற்பெருக்கி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the Black cumin seeds are Antioxidant, Antimicrobial, anti inflammatory (Mohesan kaseme), Anti diabetic (Desai S D), Anti depressant (Ehab S. Elkhayat) [96].

Recent researches of Nigella sativum:

Amin F. Majdalawieh et, al., the major signaling pathway utilized by N. sativa to manifest its anti-cancer activity is the iNOS signaling pathway. This review underscores the recent developments that highlight an effective therapeutic potential of N. sativa to suppress tumor development, reduce tumor incidence, and ameliorate carcinogenesis. In sum, experimental findings reported in the last two decades strongly suggest that N. sativa fractions could serve, alone or in combination with known chemotherapeutic drugs, as effective agents to control tumor initiation, growth, and metastasis, and hence, treatment of a wide range of cancers[97] . Mohammad Hayatul Islamet, et, al., All tested extracts of N. sativa during different phases of germination (especially 5th day germination phase) showed significant anxiolytic effect in comparison to control. Diazepam reduced locomotor activity in control (unstressed) rats but did not show affect in stressed rats while N. sativa extracts from germination phases significantly reduced locomotor activity in unstressed as well as stressed animals [98]. All the extracts of N. sativa from different germination phases exhibited significant reduction in various phases of epileptic seizure on comparison with the reference standard (diazepam). During antidepressant test, N. sativa extracts exhibited a slight reduction in the immobility of rats [99].

3.3.12. Cleome viscosa .Linn. – நல்வேளை[15]

Cleome viscosa (Family: Capparaceae) is also known as **நல்வேளை (அ) நாய்வேளை** and commonly known as Dog mustard. It occurs in northern tropical Africa, from Cape Verde and Senegal to Egypt, Ethiopia and Zanzibar; it is absent in southern Africa, but present in Madagascar and other Indian Ocean islands. Outside Africa it is widespread in peninsular Arabia, tropical Asia, Australia and tropical and subtropical America. Annual, erect, branched herb up to 1 m tall, with yellowish, glandular hairs, viscid, with a strong smell when bruised; stem angular-striate, sometimes becoming woody at base. Leaves alternate, digitately compound with 3–5 leaflets; petiole up to 6 cm long; leaflets obovate-lanceolate, 1–5.5 cm × 0.5–2 cm, gradually becoming smaller in higher leaves. The seeds have no dormancy and germinate readily after shedding. Plants start flowering 3–4 weeks

after germination and the life cycle is about 3 months. The flowers are ephemeral, opening in the morning and closing in the afternoon [100].

Chemical Constituents:

The major chemical constituents are obtained from the seeds is rich in linoleic acid and other fatty acids such as palmitic, stearic, oleic,and linolinic acids. Cleomiscosin A, cleomiscosin B, cleomiscosin C, cleomiscosin D[101] .

சிரநோய் வலிகுடைச்சல் தீராச் சயித்தியம்
உரநோ யிவைக ளொழியும் - உரமேவும்
வில்வேளைக் காயும் விழியாய் பசிகொடுக்கும்
நல்வேளை தன்னை நவில்[14]

சுவை: கைப்பு, **தன்மை:** வெப்பம் **பிரிவு:** கார்ப்பு
செய்கை: அகட்டுவாயகற்றி, வியர்வைப்பெருக்கி, இசிவகற்றி

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the Dog mustard significant activities such as s anthelmintic, antimicrobial, analgesic, antiinflammatory, immunomodulatory, antipyretic, psychopharmacological, antidiarrheal, and hepatoprotective activities (Ravindra G. Mali) [102]

Recent researches of Cleome viscosa:

Nishant Kumar Gupta et, al., the test material was found effective as hepatoprotective, through in vivo and histopathological studies. The extract was found to be effective in shortening the thiopental induced sleep in mice poisoned with CCl 4. The hepatoprotective effect of ethanolic extract was comparable to that of silymarin, a standard hepatoprotective agent. B. Parimla Devi et, al., a study was undertaken to evaluate the effect of a methanol extract of the entire plant Cleome viscosa L. (CVME) (Family; Capparidaceae) for its anti-diarrheal potential against some of the experimental models of diarrhea in rats. CVME showed significant inhibitory activity against castor-oil-induced diarrhea and PGE2- induced enteropooling in rats. The extract also showed a significant reduction in gastrointestinal motility in the charcoal meal test in rats. The results obtained establish the efficacy and substantiate the folklore claim as an anti- diarrheal agent [103].

3.3.13. Trianthema potulacastrum .Linn. – சத்திசாரணை[15]

Trianthema potulacastrum (Family: Aizoaceae) is also known as சத்திச்சாரணை (அ) வெள்ளைச்சாரணை and commonly known as Desert Horse Purslane, Giant pigweed, Horse-Purslane.It is a weed found throughout the tropical and subtropical countries. It occurs in wastelands, roadsides, lawns, gardens, cultivated crops, and in paddy fields if the water supply is low. Stems are prostrate or rising, somewhat succulent, up to 50 cm long or more, smooth or sparsely velvety. Leaves are flat, elliptic to obovate or spade-shaped, 1-2 cm long, 0.4-2 cm wide, margins entire, tip blunt, base rounded to wedge-shaped. Leaf stalks are 0.5-2.5 cm long, expanded into a sheath joined with opposing leaf base to form a cup. Pink flowers are borne solitary, stalkless, largely hidden in leaf axils. Petals (perianth lobes) are linear to narrowly deltate, 4-5 mm long, inner surface pink or white, sparsely velvety externally; ovary cylindrical; style about 2 mm long [104].

Chemical Constituents:

The major chemical constituents are ecdysterone and the other constituents are trianthenol, 3-acetylaleuritolic acid, 5,2'-dihydroxy-7-methoxy-6,8-dimethylflavone, leptorumol, 3,4-dimethoxy cinnamic acid, 5-hydroxy-2-methoxybenzaldehyde, p-methoxybenzoic acid, and beta cyanin[105] .

Phytochemical Activites:

From extensive literature review that regarding the traditional uses or phytochemical properties of the Desert Horse Purslane are Analgesic, anti inflammatory activity , Hepato protective, Antioxidant, Antidiabetic,Antimicrobial, Anti carcinogenic and wound healing property (R.Geethalakshmi) [106]

Recent researches of Trianthema decandra:

Sree lakshmi K et,al., Urolithiasis is the third most common disorder, which results from combined influence of dietary, geographical, biochemical &genetic risk factors. Hyperoxaluria was induced by administration of Ethylene glycol (EG) 0.75% and Ammonium chloride (AC) 1% in drinking water for 28 days. EG feeding results in hyperoxaluria induced oxidative stress as well as increased excretion of calcium, oxalate, and phosphate in serum levels. The present study was focused on evaluation of ethanolic extract of leaves of Trianthema portulacastrum Linn. (EETP) and Gymnema sylvestre R.Br (EEGS)

on experimentally induced urolithiasis. Cystone, a polyherbal formulation is used as a reference standard. Parameters like urinary volume, urine analysis (calcium, oxalate, phosphate, magnesium, and phosphate), serum analysis (calcium, creatinine, uric acid, BUN) and antioxidant studies were performed to access the activity. Treatment with ethanolic extract of Trianthema portulacastrum and Gymnema sylvestre at both the doses (200 mg/kg and 400 mg/kg) showed a significant restoration of urinary and serum parameters on EG&AC induction. The extracts at both doses (200 mg/kg and 400 mg/kg) showed significant increase in antioxidant enzymes activity &decrease in MDA levels. From all the protective findings of both extracts EEGS showed more potent antilithiatic activity when compared to EETP [107]. Jason Yamak et, al., Emerging studies demonstrate that crude extracts as well as bioactive phytoconstituents of T. portulacastrum exhibit potent antioxidant, anti-infective, analgesic, and anti-inflammatory activities. A growing number of in vitro and in vivo studies demonstrate various biological and pharmacological activities, including prevention and amelioration of hepatotoxicity, nephrotoxicity, hyperglycemia, hyperlipidemia, infectious diseases and cancer. This review aims to present and analyze available literature to understand the full potential of T. portulacastrum in health promotion and disease prevention. Current limitations and future directions of research on this medicinal and dietary plant are also critically discussed [108].

3.4. CLINICAL ASSESSMENT PARAMETERS

Social relationship and reciprocity

Persons with Autism generaiiy remain aloof, socially withdrawn and do not interact with other people. They have difficulty in understanding another person's feelings such as pain or sorrow.They have problems in maintain eye contact and do not develop age appropriate peer relationships

- ☑ **Eye contact** – Individuals with Autism avoid looking people in the eye. They are unable to maintain eye contact as expected.
- ☑ **Social smile** – Individuals with Autism do not smile when meeting people or in reciprocation. A smile that reflectssocial response and recognition cannot be elicited from such persons
- ☑ **Solitary and repetitive activities** - Individuals with Autism may remain alone most of the item or prefer solitary activites. They avoid playing with otheras and may not engage in group oriented activities or tasks at all.
- ☑ **Social interaction** – Individuals with Autism don not comprehend the significance of taking turns in reciprocal interaction with others. They do not wait until their turn comes or others turn ends
- ☑ **Peer relationship** - Individuals with Autism do not develop age appropriate friendships. They may not engage in age appropriate peer relationship as it is socially expected.

Emotional responsiveness

Individuals with Autism do not show the expected feelings in a social situation. Emotional reactions are unrelted to the situation and may show anxiety or fear which is excessive in nature without apparent reason. They may show inappropriate emotional reponse.

- ☑ **Inappropriate emotional response** – Persons with Autism do not show the expected feeling in a social situation. They express iappropriate emotional reponse like laughing when scolded or spanked and inappropriate degree of responses like excessive crying or laughing that is unwarranted.

- ☑ **Exaggerated emotions** - Persons with Autism may show anxiety or fear which is excessive in nature and which may be triggered off which is excessive in nature and which may be triggered off without an apparent reasons. At times, it may be exaggerated or atypical.
- ☑ **Self-stimulating emotions** - Persons with Autism may engage in self talk that is inappropriate for their age. The Autistic individual may smile to self without any apparent reason.
- ☑ **Fear for danger** - Persons with Autism may not show fera of hazards or dangers which other of the same age would show or know
- ☑ **Excited for no apparent reasons** - Persons with Autism may show excitement, over activity or agitation that is both excessive and unwarranted. The Autistic child moves around brisk energy and may difficult to control.

Speech: language and communication

Individuals with Autism have problems in speech development.They find it difficult to express their needs verbally and non verbally and may also have difficulty in understanding the non verbal language of others. People with Autism often have echolalia and may repeat a word, phrase or sentence out of context.

- ☑ **Non-verbal language to communicate the others** - Persons with Autism find it diffict to express their needs non verbally and may also have difficulty in understanding the non verbal language of others, instead of gesturing or pointing, they may lead others to desire object by dragging or pulling the latter's hand
- ☑ **Stereotyped and repetitive use of language** - Persons with Autism may repeat a word, phrase or sentence out of context. They repeat the same statement many times.
- ☑ **Unusual noises** - Persons with Autism May sueal make bizarre, noises and produce unintelligible speech like sound. They may produce speech like sounds that lack meaning.
- ☑ **Meaningless words** - Persons with Autism may use strange or meaningless words which convey no meaning
- ☑ **Understand the meaning of communication** - Persons with Autism have difficulty in understanding the true intent of speech of others. They may not understand the pragmatics of speech communication

Behavioural patterns

Persons with Autism may engage in self- stimulatory behaviour in the form of flapping hands and using as object for this purpose. They insist on following routine and may resist change. Some Autistic children may be restless and exhibit aggressive behaviour.

- ☑ **Hyperactivity and restlessness** - Persons with Autism Amy be restless with boundless energy which makes it difficult for others to control them. The hyperactivity interferes with their learning and performance tasks.
- ☑ **Aggressive behaviour** - Persons with Autism may show unprovoked aggression and socially inappropriate behaviour such as htting, kicking and pinching.
- ☑ **Attachment to inanimate objects** - Persons with Autism may be staunchly attached to certain inanimate objects which they insists on keeping with themselves such as string , rock , pen, stick, toy, bottle .
- ☑ **Self-injurious behaviour** - Persons with Autism may indulge in self injurious behaviour like bitting, hitting or mutilating self. Such individuals have to be constantly supervised to prevent injuring themselves.
- ☑ **Temper tantrums** - Persons with Autism may show the outburst of emotions like whining, crying to screaming, kicking, hitting and breath holding.

Sensory aspects

Persons with Autism are usually sensitive to sensory stimuli. Amajority of them are eitherhypo or hyper sensitive to light, sound, smell and other external stimulation. Some Autistic children explore their environment by smelling, touching or tasting objects.

- ☑ **Unusual visions** - Persons with Autism may be able to observe tiny details which may not apparent to others. Such individuals focus their attention on some insignificant part of an object that is generally ignored by others.
- ☑ **Stares into space for long periods of time** - Persons with Autism may stare at some distant spot or space for long periods of time. They seemto be unaware of surroundings when thus occupied.
- ☑ **Insensitive to pain** - Persons with Autism may hardly react to pain. They seem not to be distressed or cry when hurt. They seem to have high thresholds for pain.

- ☑ **Responds to object** - Persons with Autism may go around exploring their environment by smelling, touching, or tasting objects. Some of them may not show appropriate use of objects or toys.
- ☑ **Tracking objects** - Persons with Autism may difficulty in tracking objects or persons in motion. They are unable to follow or fix their gaze on moving objects or persons for the required period of time.

4. MATERIALS AND METHODS

4.1. Preparation of Experimental Formulations

The trial drugs were purchased from a well reputed country shop in Tambaram and the raw drug were authenticated by the Medical Botanist of National Institute of Siddha. After process the medicine was proper purification and prepared in Gunapadam lab of NIS. The Prepared medicine was stored in glass container authenticated by the concerned guide for its completeness.

4.1.1. Kuruver kudineer (Internal Medicine):

Vernacular/ Tamil name	Botanical Name	Parts Used	Part
Vettiver	*Vettiver Zaizanoids*	Root	1/4 palam
Vilamichu	*Plectranthus vettiveroids*	Root	1/4 palam
Chukku	*Zingiber officinalae*	Dried rhizome	1/4 palam
Parpadagam	*Hedyotis corymbosa*	Root	1/4 palam
Siruthaeku	*Clerodendrum serratum*	Root	1/4 palam

Purification:

வெட்டிவேர் (Vettivera zizanoides) : Cut into a small pieces and dried at day time

விலாமிச்சு (Plectranthes vettiveroides) : Cut into a small pieces and dried at day time

சுக்கு (Zingiber officinalae) :

Add 2 part of sunnakkal 1 part of Zingiber officinalae for 3 hours, wash it and then dried. After that external skin should be peeled off.

பற்படாகம் (Hedyotis corymbosa) :

Remove the dust materials then washed into pure water and then dried.

சிறுதேக்கு (Clerodendrum seratum) :

Cut into a small pieces and dried at day time

Preparation method:

Ingredients mentioned above are made as a coarse powder and then soaked it in a vessel containing of water 1 படி and heat till it comes to 1/8 th of its volume, twice a day.

Duration: 90 days

Dispensing:

Prepared medicine will be given as decoction

4.1.2. External medicine I-Sambrani thuvalai

Vernacular/ Tamil name	Botanical Name	Parts Used	Part
Vellerukan samoolam	***Calatropis giganteae***	**All parts**	**1 Kg**
Sambirani	***Styrax benzoin***	**Gum**	**1 Kg**
Veapa ennai	***Azadiracta indica***	**oil**	**2 litres**

Method:

Take all the above ingredients in equal quantity except neem oil and make it as a decoction then boiled with neem oil. After the oil is apply over whole body like a thuvalai once in a day.

Duration: 90 days

4.1.3. External Medicine- II Mysatchi pugai

Vernacular/ Tamil name	Botanical Name	Parts Used	Part
Mysatchi	*Shorea robusta*	gum	1/2 Kg
Sambirani	*Styrax benzoin*	gum resin	1/2 Kg
Agirkattai	*Aquillari agalocha*	wood	1/2 Kg
Sanninayagam	*Nigella sativum*	Seeds	1/2 Kg
Velai ver	*Cleome viscosa*	Root	1/2 Kg
Sathisaranai Ver	*Trianthema decandra*	Root	1/2 Kg

Method:

Take1- 4 ingredients mentioned above in equal quantity make as a powder and then 5-6 ingredients make it as a flamed substances. After that fumigate once in a day.

Duration: 90 days

Kuruver Kudineer (Internal Medicine)

Vettivera Zaizanoides

Plectranthus vettiveroides

Zingiber officinalae

Hedyotis corymbosa

Clerodenrum serrattum

I.Sambirani Thuvalai (External medicine)

Calatropis giganteae

Styrx benzoin

Azadiracta indica

II.Mysatchi pugai (External medicine)

Styrax benzoin

Shorea robusta

Aquillaria agalocha

Nigella sativa

Cleome viscosa

Trianthema decandra

Thvalai (Oleation therapy) [109]:

Thuvalai is also kown as oleation therapy in the field of Siddha. It is basically a type of lubrication system for the human body. It works by administrating the fatty products externally. This is used prior to the detox therapy. This process of the body makes use of the oils and ghees by consuming them or use of the oils and ghees by consuming them or using them externally as well.

Purpose of oleation therapy

1. Helps in eliminating the toxic materials from the body of the individuals.
2. Detoxifies the body and its various vital organs
3. Provides a wounderful lubrication of the various parts of the body

Procedure:

A day prior to liquid food must be consumed. The next day morning is suggested to consume the light food like porridge in empty stomach. Then it is essential to wait for the proper digestion of the entire thing. Once it is digested, go for this therapy. Afterwards, the medicated oil is applied all over the body.

Fumigation (Pugai) [101]

Fumigation denotes the artificial impregnation of the atmosphere, with the fumes or the smoke of any vegetable or aromatic substance. Fumes are also used as inhsalation therapy. Many times apart from herb, animal products including snake, birds and dropping of elephant, donkey and other animal dung are used.

Indications:

1. Fume inhalation therapy is as effective treatment for respiratory conditions such as sinusitis, bronchitis, allergies, dental caries and asthma
2. Fumigation can be considered an integral medicine and given even for an unconscious patient
3. Fumigation is done in hysteria probably the pleasabt and sharp aroma elevates the mood

Do's and Dont's:

1. Fumigation should not be done in empty stomach and it has to be done in inorganic substances.
2. Curd should be avoided
3. Fumigation with toxic substances is not advised in newborn, infants, pregnany and lactating mothers, people under influence of alcohol, suffering from the head injury.
4. A strict diet restriction is advised during treatment. The restriction includes avoiding sour food like tamarind, salt and spicy food.
5. Oil bath with application of omam paste on the vertex is suggested after the treatment period.

Sambirani Thuvalai

Mysatchi pugai

4.2. Preclinical Studies

4.2.1Physicochemical analysis of the Trial drug based on PLIM

4.2.2. Phytochemical analysis

4.2.3. Biochemical analysis

4.2.4 Pharmacological Study – Anxiolytic activity of the trial drug

4.21PHYSICOCHEMICAL ANALYSIS OF KURUVER KUDINEER CHOORANAM

The prepared medicine were analysed of Physicochemical based on PLIM done in Tamil Nadu Dr.MGR medical university, Guindy.

1. Loss on drying:

An accurately weighed 2g of Kuruver Kudineer chooranam formulation was taken in a tarred glass bottle. The crude drug was heated at 105°C for 6 hours in an oven till a constant weight. The percentage moisture content of the sample was calculated with reference to the shade dried material.

2. Determination of total ash:

Weighed accurately 2g of Kuruver Kudineer chooranam formulation was added in crucible at a temperature 600°C in a muffle furnace till carbon free ash was obtained. It was calculated with reference to the air dried drug.

3. Determination of acid insoluble ash:

Ash above obtained, was boiled for 5min with 25ml of 1M Hydrochloric acid and filtered using an ash less filter paper. Insoluble matter retained on filter paper was washed with hot water and filter paper was burnt to a constant weight in a muffle furnace. The percentage of acid insoluble as was calculated with reference to the air dried drug.

4. Determination of water soluble ash:

Total ash 1mg was boiled for 5min with 25ml water and insoluble matter collected on ash less filter paper was washed with hot water and ignited for 15 min at a temperature not exceeding 450°C in a muffle furnace. The amount of soluble ash is determined by drying the filtrate.

5. Determination of water soluble extractive:

5gm of air dried drug, coarsely powered Kuruver Kudineer chooranam was macerated with 100ml of distilled water in a closed flask for twenty- four hours, shaking frequently. The solution was filtered and 25 ml of filtered was evaporated in a tarred flat bottom shallow dish, further dried at 100°C and weighed. The percentage of water soluble extractive was calculated with reference to the air dried drugs.

6. Determination of alcohol soluble extractive:

2.5mg of air dried drugs coarsely powered Kuruver Kudineer chooranam was macerated with 50ml alcohol in a closed flask for 24 hrs. With frequent shaking, it was filtered rapidly taking precaution against loss of alcohol.10ml of filtrate was then evaporated in a tarred flat bottom shallow dish, dried at 100°C and weighed. The percentage of alcohol soluble extractive was calculated with reference to air dried drug.

4.2.2PRELIMINARY PHYTOCHEMICAL SCREENING KURUVER KUDINEER CHOORANAM

The prepared medicine were analysed of phytochemical screening done in Tamil Nadu Dr.MGR medical university, Guindy.

The preliminary phytochemical screening test was carried out for each extracts of **Kuruver Kudineer Chooranam** as per the standard procedure.

1. Detection of alkaloids:

Extracts were dissolved individually in dilute Hydrochloric acid and filtered.

a) **Mayer' Test:** Filtrates were treated with Mayer's reagent (Potassium Mercuric Iodide). Formation of a yellow colored precipitate indicates the presence of alkaloids.
b) **Wager's Test:** Filtrates were treated with Wagner's reagent (Iodine in Potassium Iodide). Formation of brown/reddish precipitate indicates the presence of alkaloids.
c) **Dragendroff's Test:** Filtrates were treated with Dragendroff's reagent (Solution of Potassium Bismuth Iodide). Formation of red precipitate indicates the presence of alkaloids.
d) **Hager's Test:** Filtrates were treated with Hager's reagent (Saturated picric acid solution). Presence of alkaloids confirmed by the formation of yellow colored precipitate.

2) Detection of carbohydrates:

Extracts were dissolved individually in 5 ml distilled water and filtered. The filtrates were used to test for the presence of carbohydrates.

a) Molisch's Test: To 2ml of plant sample extract, two drops of alcoholic solution of α-naphthol are added. The mixture is shaker well and few drops of concentrated sulphuric acid are added slowly along the sides of test tube. A violet ring indicates the pressure of carbohydrates.

b) Benedict's test: Filtrates were treated with Benedict's reagent and heated gently. Orange red precipitate indicates the presence of reducing sugars.

3. Detection of glycosides:

Extracts were hydrolyzed with dil.HCL, and then subjected to test for glycosides.

a) Modified Borntrager's Test: Extracts were treated with Ferric chloride solution and immersed in boiling water for about 5 minutes. The mixture was cooled and extracted with equal volumes of benzene. The benzene layer was separated and treated with ammonia solution. Formation of rose-pink color in the ammonical layer indicates the presence of anthranol glycosides.

b) Cardiac glycoside (Keller-Killiani test): Extract was shaken with distilled water (5 mL). To this, glacial acetic acid (2 mL) containing a few drops of ferric chloride was added followed by H2SO4 (1mL) along the side of the test tube. The formation of brown ring at the interface gives positive indication for cardiac glycoside and a violet ring may appear below the brown ring.

4. Detection of saponins:

a) Froth Test: Extracts were diluted with distilled water to 20ml and this was shaken in a graduated cylinder for 15 minutes. Formation of 1 cm layer of foam indicates the presence of saponins.

b) Foam Test: 0.5 gm of extract was shaken with 2 ml of water. If foam produced persists for ten minutes it indicates the presence of saponins.

5. Detection of phytosterols:

a) Salkowski's Test: Extracts were treated with chloroform and filtered. The filtrates were treated with few drops of Conc. sulphuric acid, shaken and allowed to stand. Appearance of golden yellow color indicates the presence of triterpenes.

6. Detection of phenols Ferric Chloride Test:

Extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black color indicates the presence of phenols.

7. Detection of tannins Gelatin test:

The extract is dissolved in 5 ml of distilled water and 2 ml of 1% solution of Gelatin containing 10% NaCl is added to it. White precipitate indicates the presence of phenolic compounds.

8. Detection of Flavonoids:

a) Alkaline reagents test: Extracts were treated with few drops of sodium hydroxide solution. Formation of intense yellow color, which becomes colorless on addition of dilute acid, indicates the presence of flavonoids.

b) Lead acetate test: Extracts were treated with few drops of lead acetate solution. Formation of yellow color precipitate indicates the presence of flavonoids.

9. Detection of proteins and amino acids:

a) Xanthoproteic test: The extracts were treated with few drops of Conc.Nitric acid. Formation of yellow color indicates the presence of proteins.

b) Ninhydrin test: To the extract, 0.25% w/v Ninhydrin reagent was added and boiled for few minutes. Formation of blue color indicates the presence of amino acids.

10. Detection of diterpenes copper Acetate test:

Extracts were dissolved in water and treated with 3-4 drops of copper Acetate solution. Formation of emerald green color indicates the presence of diterpenes.

11. Gum and Mucilage:

To 1 ml of extract add 2.5 ml of absolute alcohol and stirring constantly. Then the precipitate was dried in air and examine for its swelling properties. Swelling was observed that will indicate preence of gum and Mucilage.

12. Test for fixed oils and fats:

a) Spot test: A small quantity of extract is pressed between two filter papers. Oil stain on the paper indicates the presence of fixed oils.

13. Test for Quinones:

Extract was treated with sodium hydroxide blue or red precipitate indicates the presence of Quinones.

The preliminary phytochemical studies of aqueous extract of **Kuruver Kudineer Chooranam** were done using standard procedures. The results were presented in tables. The present study reveals that the bioactive compounds were present in all the extracts of **Kuruver Kudineer Chooranam.**

4.2.3. BIOCHEMICAL ANALYSIS OF KURUVER KUDINEER

Chemical analysis of Kuruver Kudineer was done at the Biochemistry lab at National Institute of Siddha, Chennai by the method of Kolkate.

Preparation of Extract

5ml of sample was taken in a 250ml clean beaker and added with 50ml of distilled Water .Then it is boiled well for about 10 minutes. Then it is cooled and filtered in a 100ml Volumetric flask and made up to 100ml with distilled water. This preparation is used for the Qualitative analysis of acidic| basic radicals and biochemical constituents in it.

Procedure

a) Test for Silicate

2ml of the sample was shaken well with distilled water.

b) Action of Heat

2ml of the sample was taken in a dry test tube and heated gently at first and then strong.

c) Ash Test

A filter paper was soaked into a mixture of extract and dil. Cobalt nitrate solution and introduced into the Bunsen flame and ignited.

1. Test for Acid Radicals

1.1Test for Sulphate

2ml of the above prepared extract was taken in a test tube to this added 2ml of 4% dil.ammonium oxalate solution.

1.2Test for Chloride

2ml of the above prepared extract was added with 2ml of dil.HCL is added until the effervescence ceases off.

1.3Test for Phosphate

2ml of the extract were treated with 2ml of dil.ammonium molybdate solution and 2ml of con.HNO3.

1.4Test for Carbonate

2ml of the extract was treated with 2ml of dil.magnesium sulphate solution.

1.5Test for Nitrate

1gm of the extract was heated with copper turning and concentrated H2SO4 and viewed the test tube vertically down.

2. Test for Basic Radicals

2.1. Test for Lead

2ml of the extract was added with 2ml of dil.potassium iodine solution.

2.2 Test for Copper

One pinch (25mg) of extract was made into paste with con.HCLin a watch glass and introduced into the non-luminuous part of the flame.

2.3. Test for Aluminium

To the 2ml of extract dil.sodium hydroxide was added in 5 drops to excess.

2.4. Test for Iron

a. To the 2ml of extract add 2ml of dil.ammonium solution.

b. To the 2ml of extract 2ml of thiocyanate solution and 2ml of con.HNO3 is added.

2.5. Test for Zinc

To 2ml of the extract, dil.sodium hydroxide solution was added in 5 drops to excess and dil.ammonium chloride is added.

2.6. Test for Calcium

To 2ml of the extract was added with 2ml of 4% dil. Ammonium oxalate solution.

2.7. Test for Magnesium

To 2ml of extract dil.sodium hydroxide solution was added in drops to excess.

2.8. Test for Ammonium

To 2ml of extract 1ml of Nessler's reagent and excess of dil.sodium hydroxide solution are added.

2.9. Test for Potassium

A pinch (25mg) of extract was treated of with 2ml of dil. Sodium nitrite solution and then treated with 2ml of dil.cobalt nitrate in 30% dil.glacial acetic acid.

2.10. Test for Sodium

2 pinches (50mg) of the extract is made into paste by using HCL and introduced into the blue flame of Bunsen burner.

2.11. Test for Mercury

2ml of the extract was treated with 2ml of dil.sodium hydroxide solution.

2.12. Test for Arsenic

2ml of the extract was treated with 2ml of dil. Sodium hydroxide solution.

3. Miscellaneous

3.1. Test for Starch

2ml of extract was treated with weak dil.Iodine solution.

3.2. Test for reducing sugar

5ml of Benedict's qualitative solution was taken in a test tube and allowed to boil for 2 minutes and added 8 to 10 drops of the extract and again boil it for 2 minutes.The colour change are noted.

3.3. Test for the Alkaloids

1. 2ml of the extract was treated with 2ml of dil.potassium Iodide solution.
2. 2ml of the extract was treated with 2ml of dil.picric acid.
3. 2ml of the extract was treated with 2ml of dil.phosphotungstic acid.

3.4. Test for Tannic Acid

2ml of extract was treated with 2ml of dil.ferric chloride solution.

3.5. Test for Unsaturated Compound

To the 2ml of extract 2ml of dil.potassium permanganate solution is added.

3.6. Test for Amino acid

2 drops of the extract was placed on a filter paper and dried well.20 ml of Burette reagent is added.

3.7. Test for Type of Compound

2ml of the extract was treated with 2ml of dil. Ferric chloride solution.

4.2.4. Pharmacological activity-Anxiolytic activity (Elevated plus maze method):

The pharmacological study protocol has got an approval from Institutional ethical committee of National Institute of Siddha, Chennai (NIS/IAEC/-IV/04105012017).

Species/Common name	**:** Swiss albino Mice
Age / weight / size	**:** 6 – 8 weeks/20-35g
Gender	**:** Male and female
Route of Administration	**:** Oral
Room temperature	**:** 22 ± 2^0C
Humidity	**:** 40-65%

Same sex of 3 animals was hused in propylene cages with husk bedding. Ech animal has marked in picric acid on the fur for identification (Head, Neck, Body and Base of tail) and it was indicated in cage card along with the number.CPCSEA guidelines would be strictly adhered . Animals would be monitored for health, food with adequate nutrition (Rodent pellets) and water atlibidum etc. for 24 x7 days per week. Animal husbandry would be 12-hour light and12-hour dark cycle. Monitoring room temperature at 22°C (±3°) and relative humidity are 30–70%. Polypropylene cages would be used with proper husk bedding. Animal excreta would be disposed properly and monitored hygienic condition. All animals would be observed for signs of illness, injury or abnormal behaviour treated with veterinary surgeon. If any animal die immediately post-mortem would done for observation of autopsy changesDiseased animals would be monitored, treated and quarantined in the separate cages After the experimental period, animals would be reutilized for another study followed by acclimation period or else would be leave independently.

The Elevated plus maze has been described as simple method for assessing anxiety response of rodents. The apparatus used for the elevated plus maze test is in the configure of a+ and comprises two arms (25*5*0.5cm) across from each other and perpendicular to two closed arms (25*5*16cm) with a centre platform (5*5*0.5 cm). The open arms have a very small (0.5cm) wall to decrease the number of fall, whereas the closed arms have a high

(16cm) wall to enclose the arm. The entire apparatus is 50cm above the floor and is placed in empty circular tank to protect the mice that fall or attempt to escape during the experiment .The apparatus is made of plastic materials. The platform is white and the walls are transparent. There is a variation and colours of the apparatus of elevated plus maze.

The behaviour testing room is soundproof and the illumination level is maintained at 100 lux. A mouse is placed in the centre area of the maze in its head directed toward a closed arm. The elevated plus maze test is observed. The number of entries into each arm and the time spent in the open arms are recorded and these measurements serve as an index of anxiety like behaviour. Mice are allowed to move freely about the maze for 10 min. The distance travelled the number of entries into each arm, the time spent in each arm and the per cent of entries into the open arm are calculated. After each trail, all arms and the centre area are cleaned with super hypo chlorous water, that is an efficient odour removal agent and has relatively weak odour of itself compared to their cleaning solutions to prevent a bias based on olfactory cues.

Thus we can conduct the tests under controlled condition regarding olfactory cues. A task using a y shaped apparatus that include on elevated open alley which produced a strong approach avoidance conflict ad and closed assay. The Mice demonstrated the most robust avoidance response in the first 5 min after placement in the elevated open alleys. The behaviour that is typically observed when rodents are in the elevated plus maze time spends and entries made on the open and closed arms. Antianxiety behaviour can be determined simultaneously with a measure of spontaneous motor activity and the arm entries made in the maximum of an optimal motor activity.

4.3. Clinical studies:

A Protocol was prepared and submitted before IEC of National Institute of Siddha. The IEC approval number is NIS/IEC/2016/11-19/ 14.10.2016 and my registered CTRI number is CTRI/2017/05/008698. After getting the approval from committee, the clinical study on Mantha sanni (Autism spectrum disorder) in children and drug of choice was Kuruver kudineer carried out as per the protocol.

The trial drug “KURUVER KUDINEER” is given for 90 days .For OP patients before and after treatment the clinical assessment will be done and prognosis is noted.

4.3.1. INCLUSION CRITERIA:

Children of age group under 3- 12 years

Impaired social interaction

Mild to Moderate aggressiveness

Repetitive behaviour

Lack of eye contact

Babble sound

Clinically diagnosed as a ASD

Child will be include 4 or more criteria for this clinical trial study

4.3.2. Exclusion criteria:

Epilepsy

Severe aggressiveness

Cerebral palsy

Congenital heart disease

4.3.3. Withdrawal criteria

Intolerance to the drug and development of adverse reactions during trial

Poor patient compliance and defaulters

Patient turned unwilling to continue in the course of clinical trial

4.3.4. Clinical assessment parameters:

Social relationship and reciprocity

- ☑ Eye contact
- ☑ Social smile
- ☑ Solitary and repetitive activities
- ☑ Social interaction
- ☑ Peer relationship

Emotional responsiveness

- ☑ Inappropriate Emotional response
- ☑ Exaggerated emotions
- ☑ Self-stimulating emotions
- ☑ Fear for danger
- ☑ Excited for no apparent reasons

Speech: language and communication

- ☑ Non-verbal language to communicate the others
- ☑ Stereotyped and repetitive use of language
- ☑ Unusual noises
- ☑ Meaningless words
- ☑ Understand the real meaning of communication

Behavioural patterns

- ☑ Hyperactivity and restlessness
- ☑ Aggressive behaviour
- ☑ Attachment to inanimate objects
- ☑ Self-injurious behaviour
- ☑ temper tantrums

Sensory aspects

- ☑ Unusual visions
- ☑ Stares into space for long periods of time
- ☑ Insensitive to pain
- ☑ Responds to object
- ☑ Tracking objects

Children were assessed for improvement on 0th, 30th, 60th, 90th day of treatment and the results were entered in the assessment forms. The results were analysed by computing the scores as 0 score – Never (5), 1 score – Sometimes (10), 2 score – Often (15), 3 score – Mostly (20), 4 score – Always (25) exhibits the skills in Autism Clinical Assessment Parameters.

Autistic child	**Severe**	**Moderate to severe**	**Mild to Moderate**	**Mild**	**Normal to Mild**
Score Range	(125-249)	(250-374)	(375-499)	(500-624)	(≥625)

4.3.4. Siddha Method of Assessment

Nilam

Kaalam

NeerThathukal

Udal Thathukal

Envagai Thervugal

Neerkuri

Neikruri

Study Enrolment:

1. In this study, patients reporting at the NIS OPD with three or more clinical symptoms were examined clinically for enrolling in this study based on the inclusion and exclusion criteria
2. The patients were enrolled to be informed about the study, trial drug, possible outcomes and the objectives of the study in the language and terms understandable to them and to their informants.
3. After ascertaining the patient and informants willingness, informed consent was obtained in writing from them in the consent form (Form II).
4. All these patients were given unique registration card in which patient's Registration number of the study; Address, Phone number and Doctors phone number etc. were given, so as to report easily should any complication arise.
5. Complete clinical history, complaints and duration, examination findings all were recorded in the prescribed Profoma in the history and clinical assessment forms separately.

Patients were advised to take the trial drug and appropriate dietry advices were given according to the patient informant's perfect understanding.

Conduct of the study:

The trail drug Kuruver Kudineer were given continuously for 90 days.After that patient will be requested to attend the OPD for clinical assessment and it will be recorded in the clinical assessment form and prognosis noted. The patient's informants are requested to bring back the un-consumed trial drug if any. For IP patients the drug will be provided daily and prognosis will be noted. Laboratory investigations will be done on the day before the start of my study. After the completion of the treatment, the patient is advised to visit our OPD for follow up.

DATA COLLECTION FORMS

FORM 1 SCREENING AND SELECTION PROFORMA

FORM 2 CONSENT FORM

FORM 3 CASE REPORT PROFOMA

FORM 4 PATIENT'S INFORMATION SHEET

FORM 5 DRUG COMPLIANCE

FORM 6 WITHDRAWAL FORM
FORM 7ADVERSE REACTION FORM
FORM 8 PHARMACOVIGILENCE FORM
FORM 9 DIETARY ADVICE FORM.

Data Management:

After enrolling the patient in the study a separate file for each patient will be opened and all forms were filled in the file. Whenever study patient visits OPD during the study period, the respective patient file were taken and necessary recordings were made at the assessment form or other suitable form.The screening forms were filed separately.The Data recordings were monitered for completion all collected data were enterd using MS access software onto computer. Investigators were trained to enter the patient data and cross checked by SRO.

Adverse effects / serious effect Management:

If the trial patient develops any adverse reaction he /she were immediately withdrawn from the trial and proper management were given in OPD of NIS and the same were reported to regional pharmacovigilance centre.The details of adverse reactions were recorded in prescribed Pharmacovigilance centre.

Ethical Issues:

To prevent infection, while collecting blood sample from the patient, only disposable syringes, disposable gloves, with proper sterilization of lab equipements will be used

No other external and internal medicines were used. There were no infringements on the rights of patient.

The data collected from the children's parent /guardians were kept confidentially. The patient's parent /guardian were informed about the diagnosis, treatment and follow up.

After the consent of the patient (through consent form) they were enrolled in the study.

Informed consent was obtained from the patient's parent / guardian explaining in the understandable language to his / her for the enrollment of the study.

Treatment were provided free of cost

In condition of treatment failure, adverse reactions, patients were given alternative treatment at the NIS with full care

5. RESULT AND ANALYSIS

Table.5.1. Physico Chemical Analysis of Kuruver Kudineer

S.No	Parameters	Percentage
1	Loss on drying	5.54%
2	Total ash value	6.82%
3	Acid insoluble ash	1.81%
4	Water soluble ash	2.40%
5	Water soluble extraction	33.23%
6	Alcohol soluble extraction	10.76%

Table.5.2.Phytocomponents Result:

S.no	Phytochemicals	Test Name	H2O Extract
1	Alkaloids	Mayer's Test	+ve
		Wagner's Test	-ve
		Dragendroff'sTest	-ve
		Hager's Test	-ve
2	Carbohydrates	Molisch's Test	+ve
		Benedict's Test	+ve
3	Glycoside	Modified Borntrager's Test	-ve
		Keller Killaini	-ve
4	Saponin	Froth Test	+ve
		Foam Test	-ve
5	Phytosterol	Salkowski's Test	-ve
6	Phenols	Ferric Chloride Test	-ve

7	Tannins	Gelatin Test	-ve
8	Flavonoids	Alkaline Reagent Test	+ve
		Lead acetate Test	+ve
9	Proteins and amino acids	Xanthoproteic Test	-ve
10	Diterpenes	Copper Acetate Test	+ve
11	Gum & Mucilage	Extract + Alcohol	-ve
12	Fat & Fixed Oil	Spot Test	-ve
13	Quinones	NAOH + Extract	+ve

\+ Indicates positive

\- Indicates Negative

5.3. Biochemical analysis of Kuruver kudineer

Table.5.3.1.Results of Acid radical's studies

S.NO	Parameter	Observation	Result
1	Test for Sulphate	No Cloudy appearance.	Positive
2	Test for Chloride	Cloudy appearance present	Positive
3	Test For Phosphate	No Cloudy yellow appearance	Negative
4	Test For Carbonate	-	Negative
5	Test For Nitrate	-	Negative

6	Test for Sulphide	-	Negative
7	Test For Fluoride &oxalate	-	Negative
8	Test For Nitrite	-	Negative
9	Test For Borax	-	Negative

Interpretation

The acidic radicals test shows the presence of **Sulphate, Chloride.**

Table 5.3.2: Results of basic radicals studies.

S.NO	Parameter	Observation	Result
1	Test for Lead	-	Negative
2	Test for Copper	-	Negative
3	Test For Aluminium	-	Negative
4	Test For Iron.	Red colour appeared	Positive
5	Test For Zinc	-	Negative
6	Test for Calcium	-	Negative
7	Test For Magnesium	-	Negative
8	Test For Ammonium	-	Negative
9	Test For Potassium	-	Negative

10	Test For Sodium	-	Negative
11	Test For Mercury	-	Negative
12	Test For Arsenic	-	Negative

Interpretation

The basic radical test shows the presence of **Iron,** and absence of heavy metals such as lead, arsenic and mercury.

Table5. 3.3 .Results of miscellaneous test:

S.NO	Parameter	Observation	Result
1	Test for Starch	-	Negative
2	Test for Reducing sugars	-	Negative
3	Test For Alkaloids .	Yellow colour developed	Positive
4	Test For Tannic acid .	Blue-black precipitate obtained	Positive
5	Test for unsaturated compounds	-	Negative
6	Test for Amino acid	-	Negative
7	Test For Type of compounds	Blue colour developed.	Positive

Interpretation:

The Miscellaneous test shows the presence of Alkaloid**, Tannic acid, Type of Compounds.**

5.4. Anxiolytic activity (Elevated plus maze method) of Kuruver kudineer

Table 5.4.1 Anxiolytic activity of Kuruver Kudineer

Average Calculation (n=6)				
Control group	**Open arm**		**Closed arm**	
	Number of entry	5	Number of entry	12
	Spent time	34sec	Spent time	1min56sec
Standard group (Alprazolom IP)	**Open arm**		**Closed arm**	
	Number of entry	8	Number of entry	11
	Spent time	1min7sec	Spent time	2min4sec
Low Dose (Kuruver kudineer)	**Open arm**		**Closed arm**	
	Number of entry	13	Number of entry	12
	Spent time	1min8sec	Spent time	2min5sec
High Dose (Kuruver kudineer)	**Open arm**		**Closed arm**	
	Number of entry	9	Number of entry	10
	Spent time	1min2sec	Spent time	2min9sec

5.5. CLINICAL STUDIES

For the clinical study 30 cases with confirmed diagnosis of Mantha sanni were selected and treated with Kuruver kudineer with dosage of 30ml BD for 90 days in the Outpatient department of P.G Kuzhandhai Maruthuvam, Ayothidoss Pandithar Hospital NIS, and Chennai 47.

Results were observed with respect to the following criteria

1. Sex
2. Age
3. Parent’s Socio Economic Status
4. Religion
5. Family history
6. Thinaikal
7. Immunisation history
8. Diet
9. Uyirthathukkal
10. Ezhuudalkattugal
11. .Envagaithervugal
12. Neikuri
13. Clinical features &Clinical assessment parameters

Table.5.5.1.Frequency and percentage of patients with Mantha sanni according to Gender

S.NO	GENDER	NO OF CASES (out of 30 cases)	PERCENTAGE %
1	Male child	19	63
2	Female child	11	37
3	Total	30	100

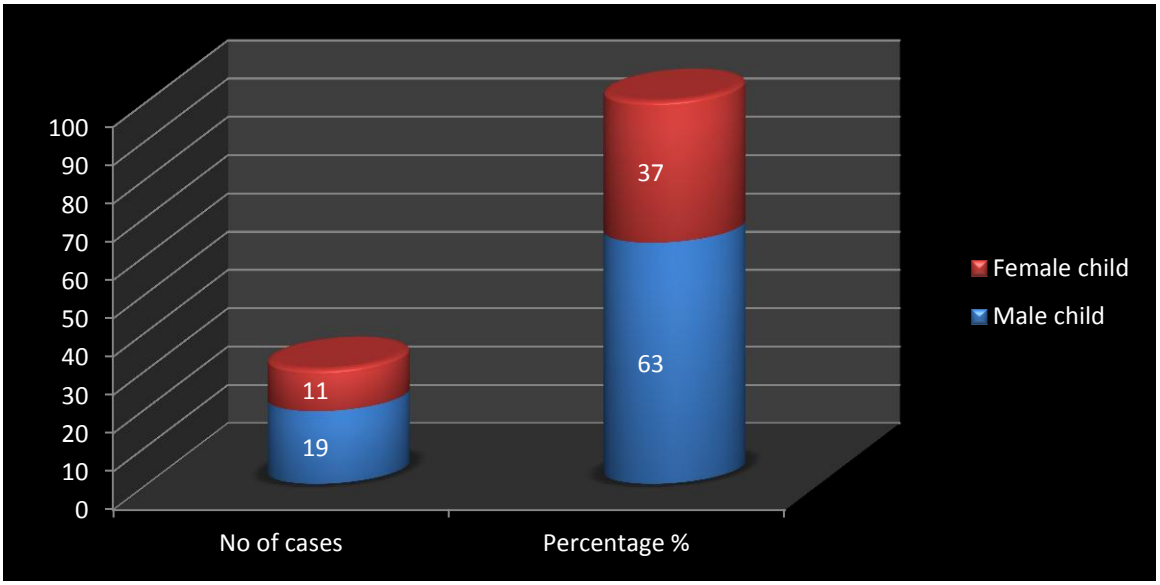

Fig:5.5.1.Frequency and percentage of cases according to gender

Inference:

Out of 30 patients 63% were male children and 37% were female children. Though 63% were male children so there is no related in sex difference and this disease can affect either sex.

Table 5.5.2.Frequency and percentage of patients with Mantha sanni according to Age

S.NO	AGE IN YEARS	NO OF CASES (out of 30 cases)	PERCENTAGE %
1	3- 6 years	18	60
2	7-9 years	9	30
3	10-12 years	3	10
4	Total	30	100

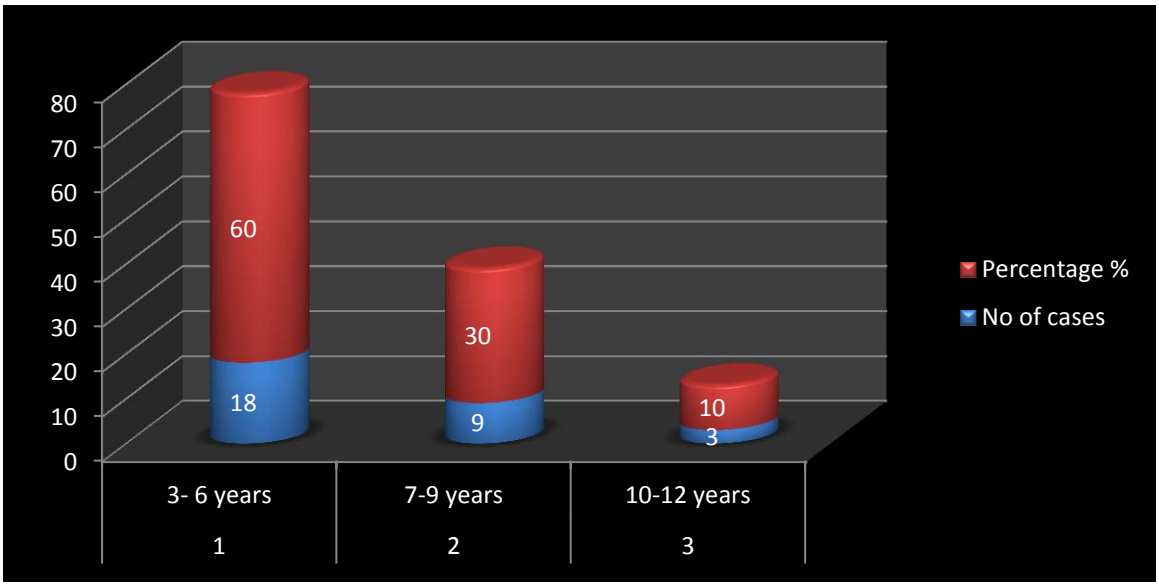

Fig 5.5.2: Frequency and percentage of patients according to Age

Inference:

Out of 30 patients, 60% of cases were 3-6 years, 30% of cases were 7-9 years, and 10% of cases were 10-12years. So there is more number of children present at the 3-6 years age group.

Table.5.5.3.Frequency and percentage of patients with Mantha sanni according to Parent's Socio Economic Status.

S.NO	SOCIO ECONOMIC STATUS	NO OF CASES (out of 30 cases)	PERCENTAGE (%)
1	High Income Group	13	43%
2	Middle Income Group	11	37%
3	Lower Income Group	6	20%
4	Total	30	100

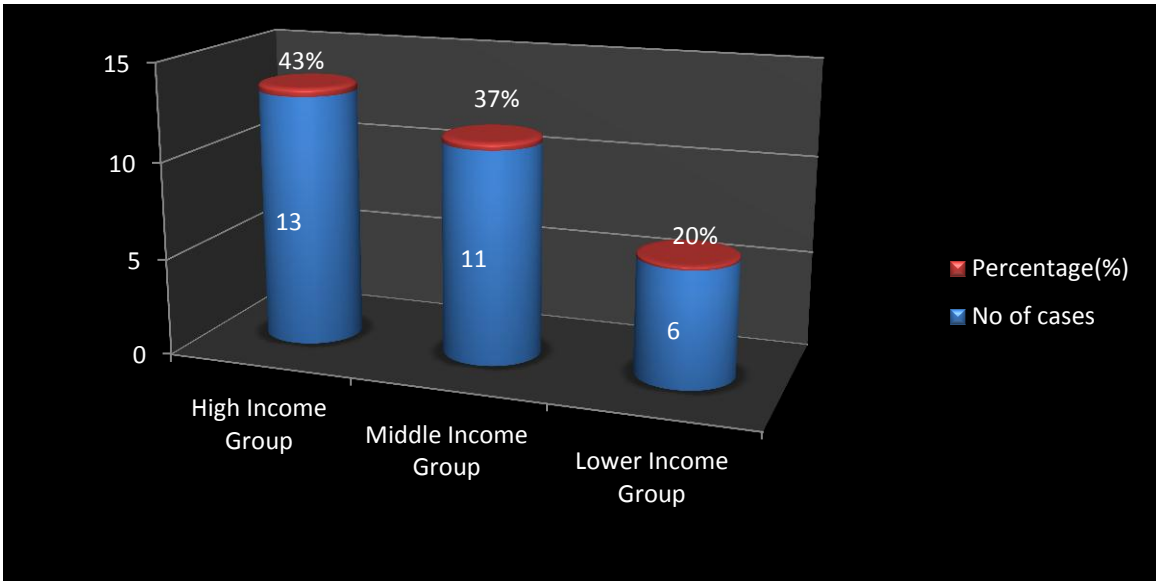

Fig5.5.3: Frequency and percentage of patients according to Parent's Socio Economic Status.

Inference:

About 43% patients were under high income group, 37% patients were under middle income group, 20%patients were lower income group. The highest incidence was in high income group. So there is no related in this disease can affect either income.

Table.5.5.4.Frequency and percentage of patients with Mantha sanni according to Religion

S.NO	RELIGION	NO OF CASES (out of 30 cases)	PERCENTAGE (%)
1	Hindu	27	90%
2	Muslim	1	3.30%
3	Christian	2	6.70%
4	Total	30	100

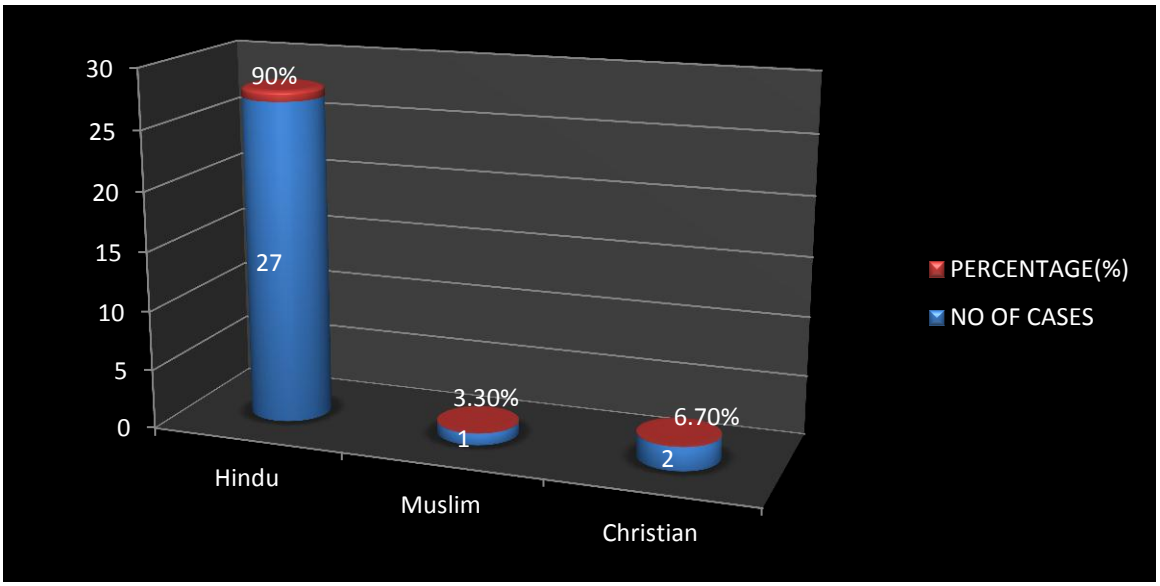

Fig.5.5.4.Frequency and percentage of patients according to Religion

Inference:

Out of 30 patients, 90% of the cases were Hindu, 3.30% of the cases were Muslim, and 6.70% of the cases were Christian. Though more number of cases were reported to be Hindu, there is no relation between the incidence of the disease is respect to religion.

Table.5.4.5.Frequency and percentage of patients with Mantha sanni according to Thinaigal

S.NO	THINAIKAL	NO OF CASES (out of 30 cases)	PERCENTAGE (%)
1	Kurinji	2	6.70%
2	Mullai	0	0
3	Marutham	0	0
4	Neithal	28	93.30%
5	Paalai	0	0
6	Total	30	100

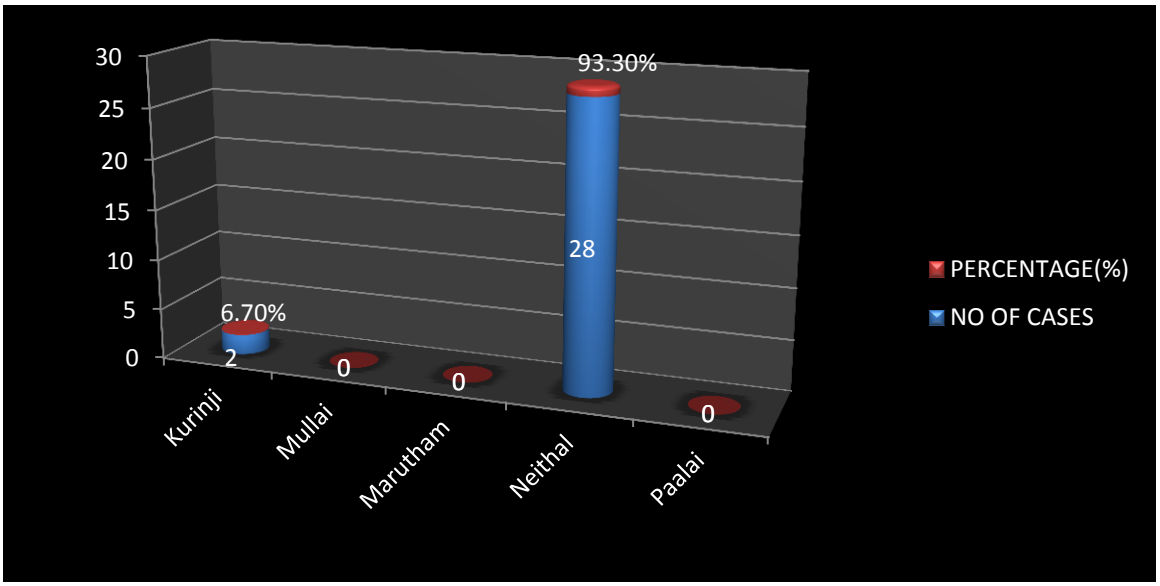

Fig.5.4.5: Frequency and percentage of patients according to Thinaigal

Inference:

According to Siddha concept, the people living in marutham lead a disease free life. But now days both life style and habits of the people entirely differs from ancestor leading to disease .since the study was conducted in neithal nilam and around Chennai.

Table .5.5.6.Frequency and percentage of patients with Mantha sanni according to Diet.

FOOD HABITS	NO. OF CASES (Out of 30 cases)	PERCENTAGE (%)
Vegetarian	4	13.30%
Mixed diet	26	86.70%
Total	30	100%

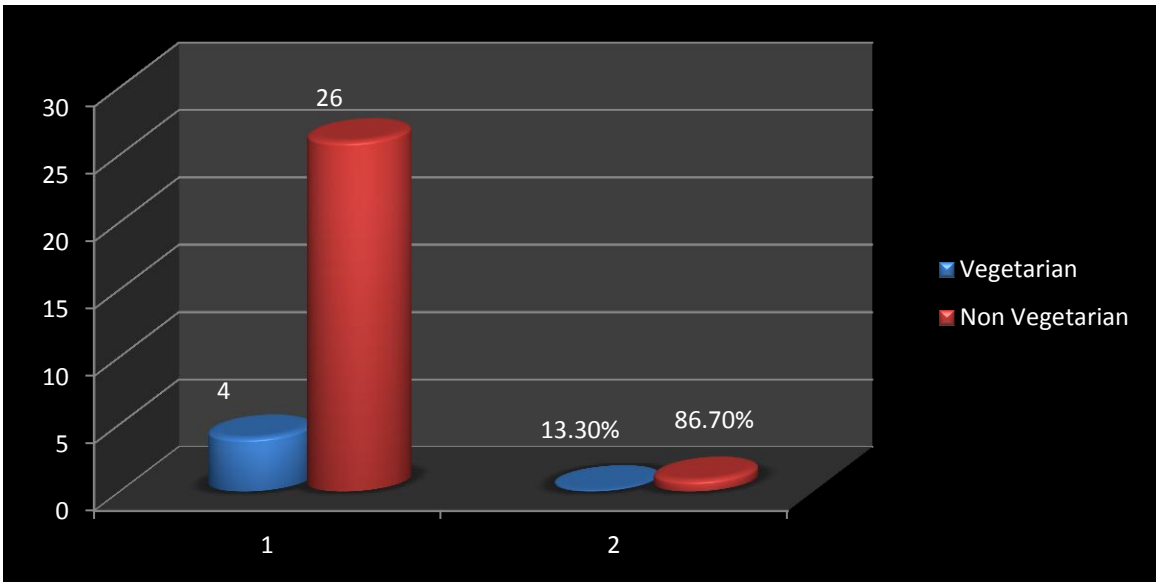

Fig.5.5.6.Frequency and percentage of patients according to Diet.

Inference:

Out of 30 patients, 13.30% of the cases were Vegetarian, 86.70% of the cases were Non vegetarian.Though more number of cases were reported to be Non vegetarian, and there is no relation between the incidences of the disease.

Table .5.5.7.Frequency and distribution of patients with Mantha sanni according to Immunisation.

IMMUNISATION HISTORY	NO.OF CASES (out of 30 cases)	PERCENTAGE
Complete	27	90%
Incomplete	2	6.70%
Complete but time lag	1	3.30%
Total	30	100

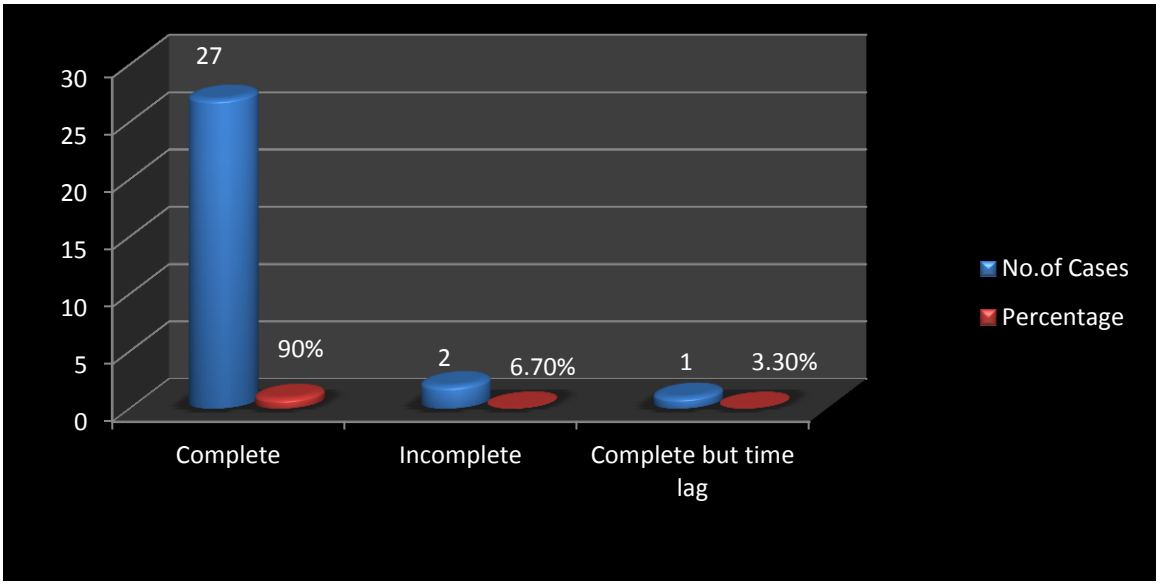

Fig.5.5.7.Frequency and distribution of patients according to Immunisation.

Inference:

Out of 30 patients, 90% of the cases were proper immunisation, 6.70% of the cases were improper immunisation and 3.30% of the cases were proper immunisation but time lag.Though more number of cases were reported to be proper immunisation history, there is no relation between the incidences of the disease.

Table 5.5.8.Frequency and percentage of patients according to Uyir Thathukkal (Vatham)

S.NO	TYPES OF VATHAM	NO. OF CASES (OUT OF 30)	PERCENTAGE %
1	Praanan	20	66.7
2	Abaanan	2	6.7
3	Samaanan	2	6.7
4	Uthaanan	0	0
5	Viyaanan	0	0
6	Naagan	6	20
7	Koorman	5	16.7
8	Kirukaran	0	0
9	Devathatthan	0	0
10	Dhananjeyan	0	0

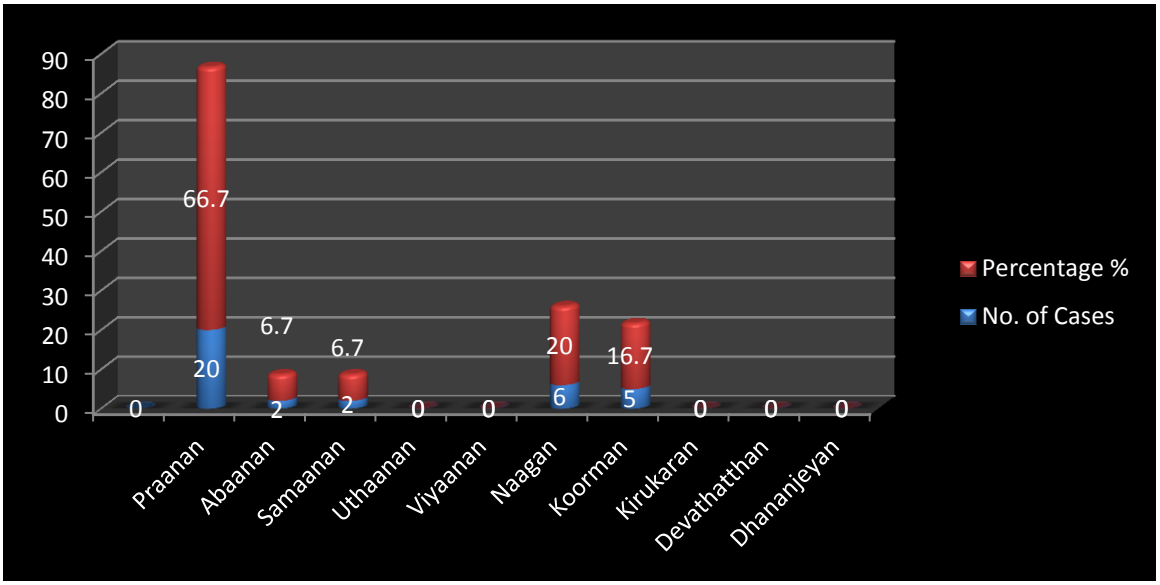

Fig.5.5.8: Frequency and percentage of patients according to Uyir Thathukkal

Inference

According to vatham, praanan was affected in 66.7% cases because of sleep disturbances ,abanan was affected in 6.7% cases because constipation, samaanan was affected in 6.7% cases due to derangement of other vatha's, Naagan was affected in 2% cases due topoor eye to eye contact ,koorman was affected in 16.7% cases due to eye contact.

Table.5.5.9: Frequency and percentage of patients with Mantha sanni according to Uyir Thathukkal (Pitham).

S.NO	TYPES OF PITHAM	NO OF CASES (Out of 30)	PERCENTAGE
1	Analagam	20	66.7
2	Ranjagam	2	6.7
3	Sathagam	0	0
4	Alosagam	14	46.70%
5	Prasagam	0	0

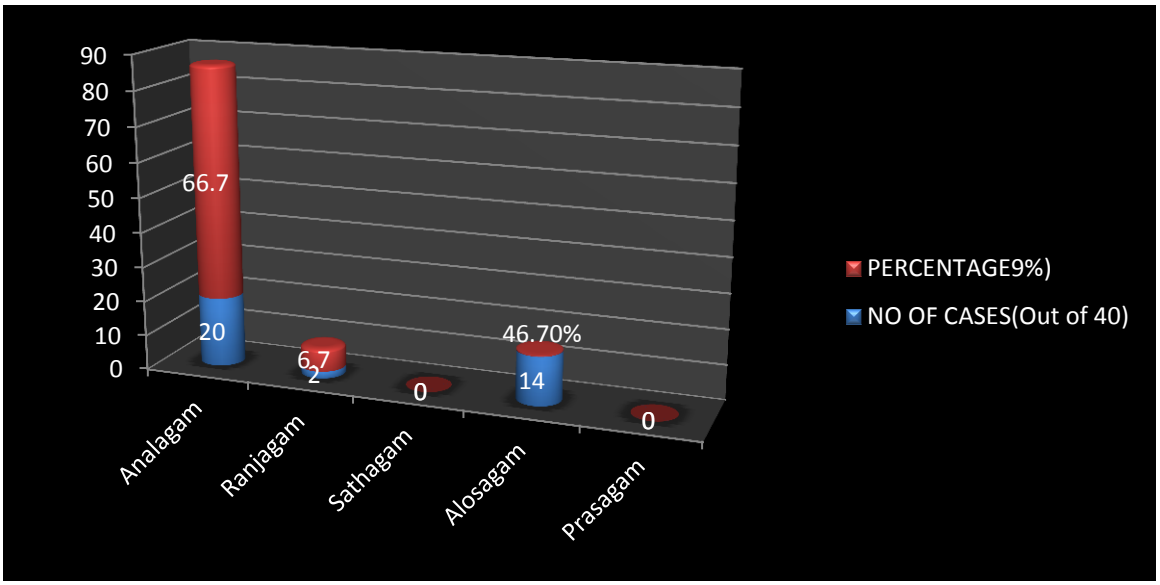

Fig 5.5.9: Frequency and percentage of patients according to Uyir Thathukkal (Pitham).

Inference

According to pitham, analagam was affected in all cases (100%) because of poor appetite, ranjagam was affected 10% because pallor of the eyes.

Table 5.5.10: Frequency and percentage of patients with Mantha sanni according to Uyir Thathukkal (Iyyam).

S.NO	TYPES OF IYYAM	NO OF CASES (Out of 30)	PERCENTAGE(%)
1	Avalambagam	0	0
2	Klethagam	0	0
3	Pothagam	0	0
4	Tharpagam	14	46.7
5	Santhigam	0	0

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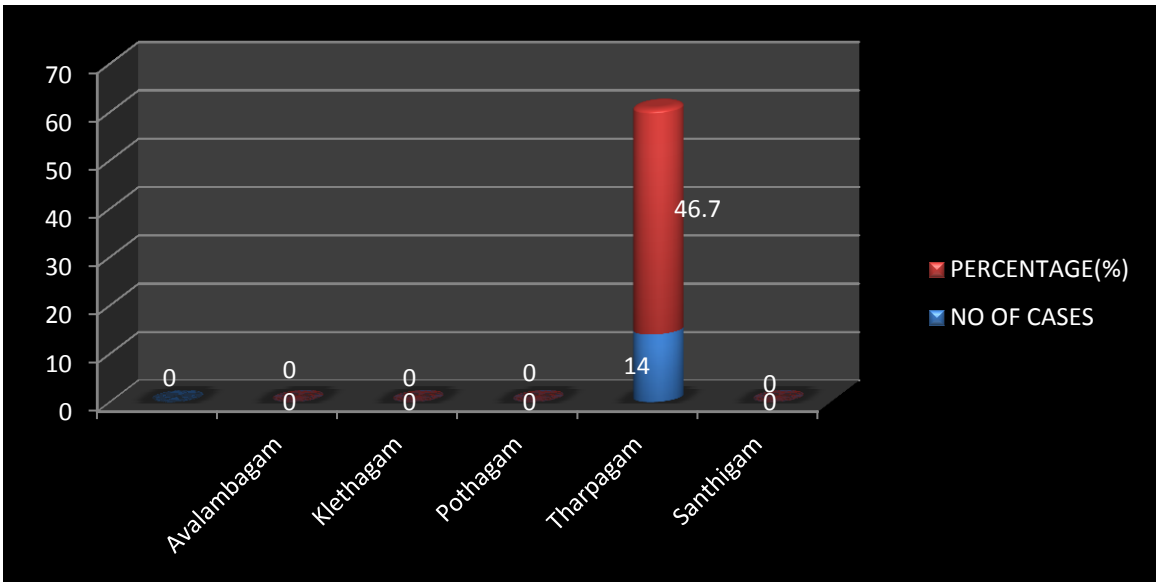


Fig 5.5.10: Frequency and percentage of patients according to Uyir Thathukkal (Iyyam).

Inference

According to Iyyam, Tharpagam was affected in 14 cases (46.7%) due to poor eye to eye contact

Table.5.5.11.Frequency and percentage of patients with Mantha sanniaccording to UdalThathukkal

S.NO	UDALTHATHUKKAL	NO OF CASES (out of 30 Cases)	PERCENTAGE
1	Saaram	4	13.4
2	Senneer	2	6.7
3	Oon	0	0
4	Kozhuppu	0	0
5	Enbu	0	0
6	Moolai	0	0
7	Sukkilam/Suronitham	0	0

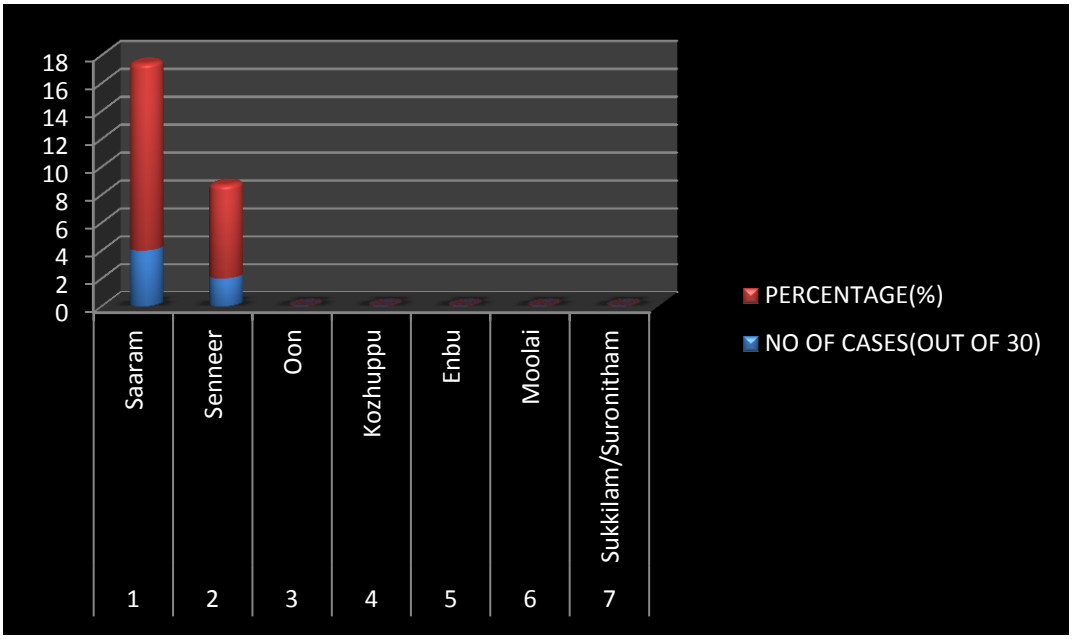


Fig.5.5.11: Frequency and distribution of patients with Mantha sanniaccording to UdalThathukkal

Inference

According to Udalthathukkal, Saaram was affected 13.4% due to Anaemic, Senneer was affected 6.7% because pallor of the tongue.

Table 5.5.12. Frequency and percentage of patients with Mantha sanni according to Envagaithervugal.

S.NO	ENVAGAITHERVUGAL	NO OF CASES (out of 30 Cases)	PERCENTAGE (%)
1	Naa	3	10
2	Niram	0	0
3	Mozhi	0	0
4	Vizhi	14	46.7
5	Sparism	0	0
6	Naadi-Kaba vatham	30	100
7	Malam	0	0
8	Moothiram	0	0

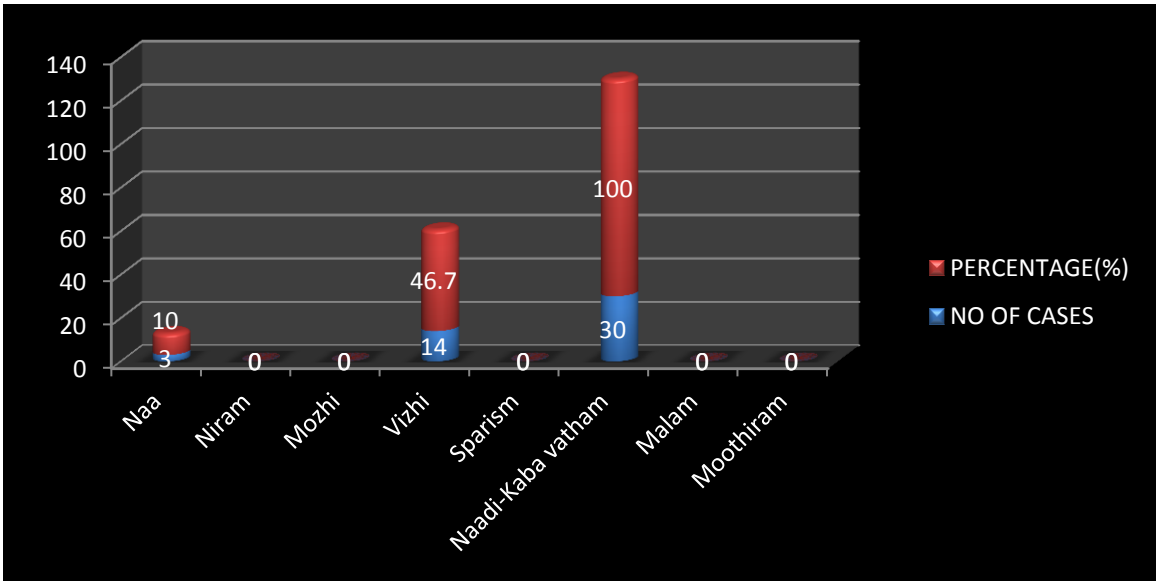


Fig.5.5.12: Frequency and percentage of patients according to Envagaithervugal

Inference

In Naadi has been observed in 30 cases, 100% of cases had Kabavatha naadi, Naa was affected in 10 (3%) cases as they had Pallor in tongue .vizhi was affected in 14 (46.7%) cases , as the had poor eye to eye contact.

Table.5.5.13.Frequency and percentage of patients with Mantha sanni according to Neikuri.

S.NO	NEIKURI	NO OF CASES (0ut of 30 cases)	PERCENTAGE (%)
1	Vatham	3	10
2	Pitham	2	6.7
3.	Kabam	25	83.3

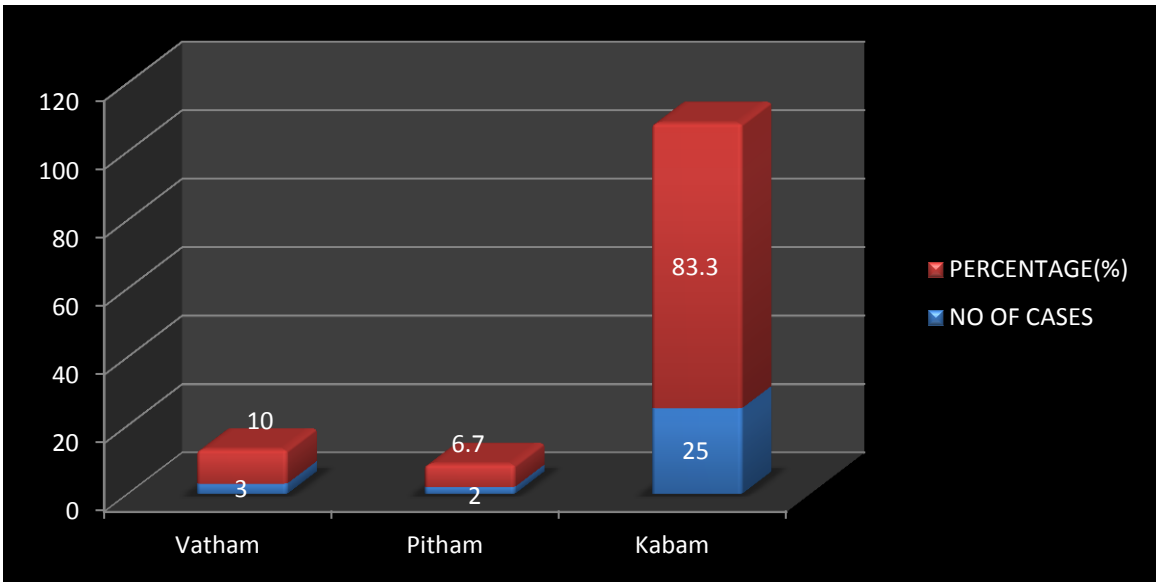


Fig.5.5.13: Frequency and percentage of patients according to Neikuri

Inference

According to Neikuri, Vatham neer was observed in 10% of cases.Pitham neer was observed in 6.7% of cases.Kabam neer was observed in 83.3% of cases.

Table.5.5.14: Frequency and percentage of patients according to clinical features

S.NO	CLINICAL FEATURES	NO. OF PATIENTS (OUT OF 30CASES)	PERCENTAGE(%)
1	Children of age group under 3- 12 years	30	100
2	Impaired social interaction	13	43.4
3	Mild aggressive	10	33.4
4	Repetitive behaviour	4	13.4
5	Lack of eye contact	14	46.7
6	Blabble sound	8	26.7
7	Clinically diagnosed as a ASD	30	100

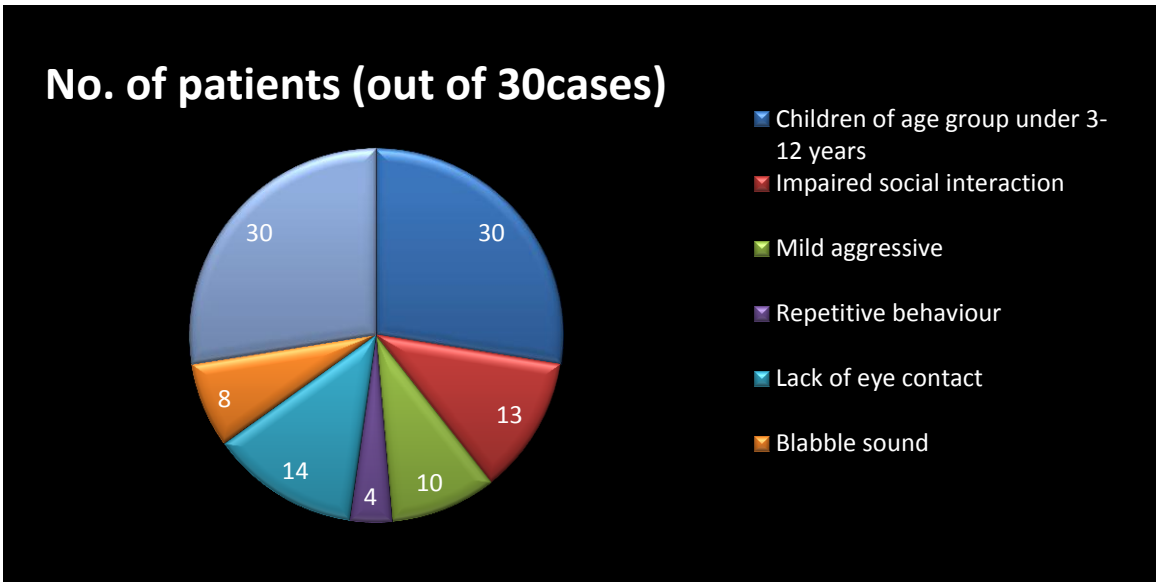


Fig.5.5.14: Frequency and percentage of patients according to clinical features

Inference:

According to Clinical features, 100% of cases were Children under 3-12 years of age, clinicaly diagnosed as ASD, 13% of cases were Impaired social interaction, 14% of cases were lack of eye to eye contact, 8% of cases are blabble sound,3% of cases were Mild aggressivenessand 4% of cases were repititive behaviour present

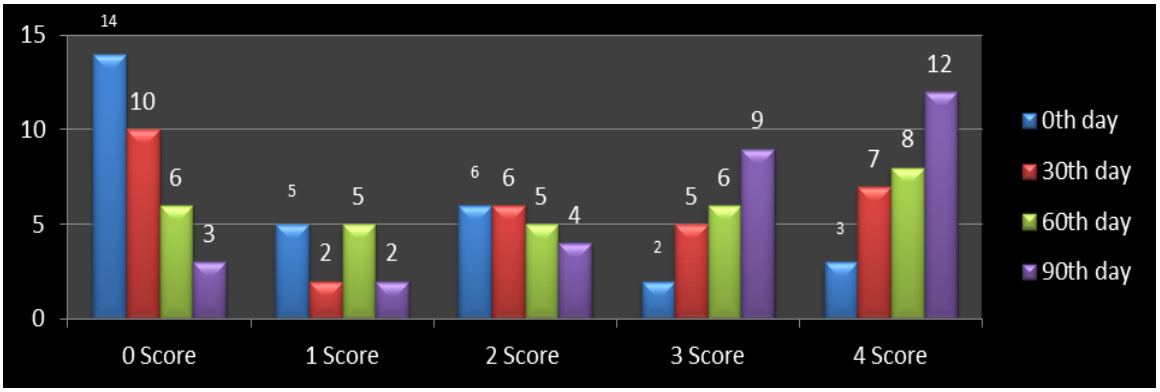
5.5.15. CLINICAL ASSESSMENT PARAMETERS

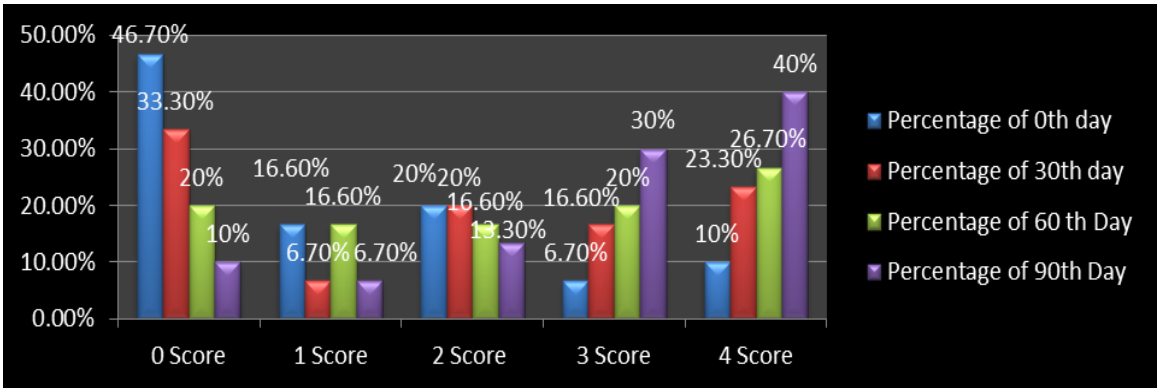
SOCIAL RELATIONSHIP AND RECIPROCITY

Table 5.5.15.1. Frequency and percentage distribution of Eye Contact:

EYE CONTACT								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	14	46.70%	10	33.30%	6	20%	3	10%
1	5	16.60%	2	6.70%	5	16.60%	2	6.70%
2	6	20%	6	20%	5	16.60%	4	13.30%
3	2	6.70%	5	16.60%	6	20%	9	30%
4	3	10%	7	23.30%	8	26.70%	12	40%

5.5.15.1.Frequency and percentage distribution of Eye Contact:





Inference:

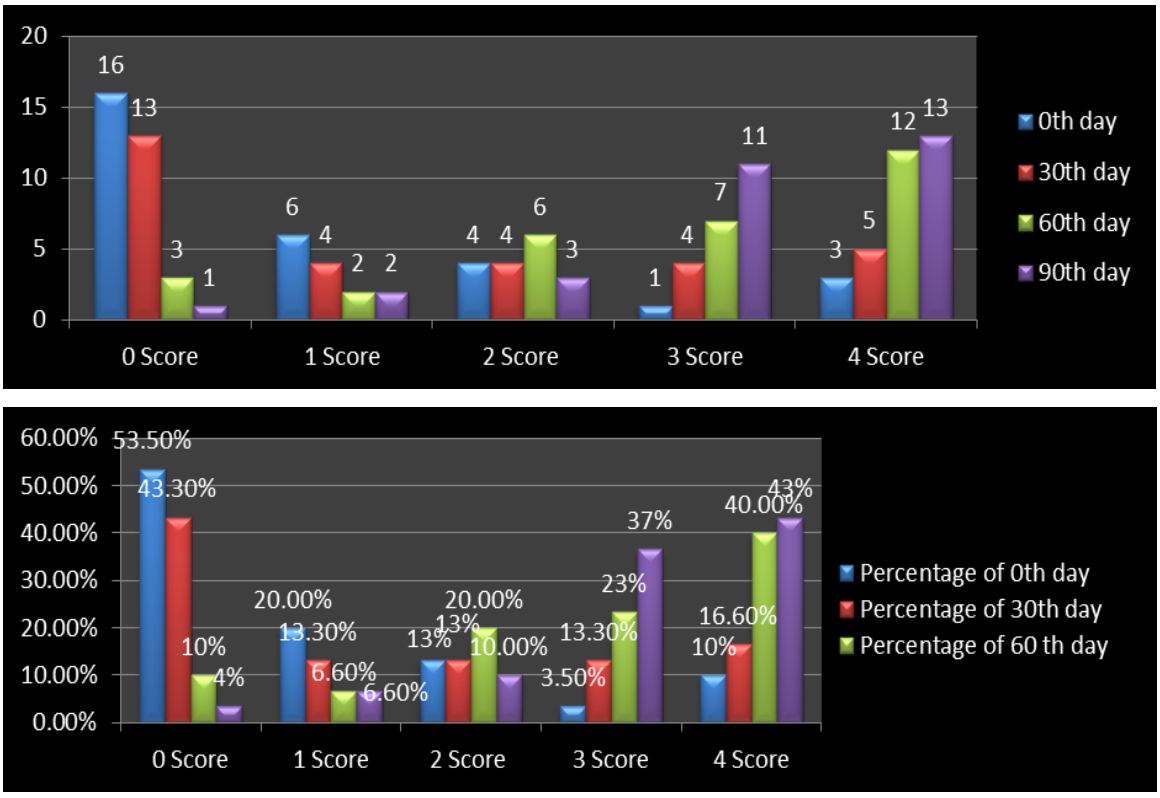
From the above table 46.7% of children had score-0 on 0th day and 10% of children had on 90th day. 16.60 % of children had Score-1 on 0th day and 6.70% of children had on 90th day. 20% of children had Score-2 on 0th day and 13.30% of children had on 90th day. 6.70% of children had score-3 on 0th day and 30% of children had on 90th day. 10% of children had score-4 on 0th Day and 40% of children had on 90th day.

SOCIAL RELATIONSHIP AND RECIPROCITY

Table 5.5.15.2 Frequency and percentage distribution of Social Smile:

SOCIAL SMILE								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	16	53.50%	13	43.30%	3	10%	1	4%
1	6	20.00%	4	13.30%	2	6.60%	2	6.60%
2	4	13%	4	13%	6	20.00%	3	10.00%
3	1	3.50%	4	13.30%	7	23%	11	37%
4	3	10%	5	16.60%	12	40.00%	13	43%

Fig 5.5.15.2 Frequency and percentage distribution of Social Smile:



Inference:

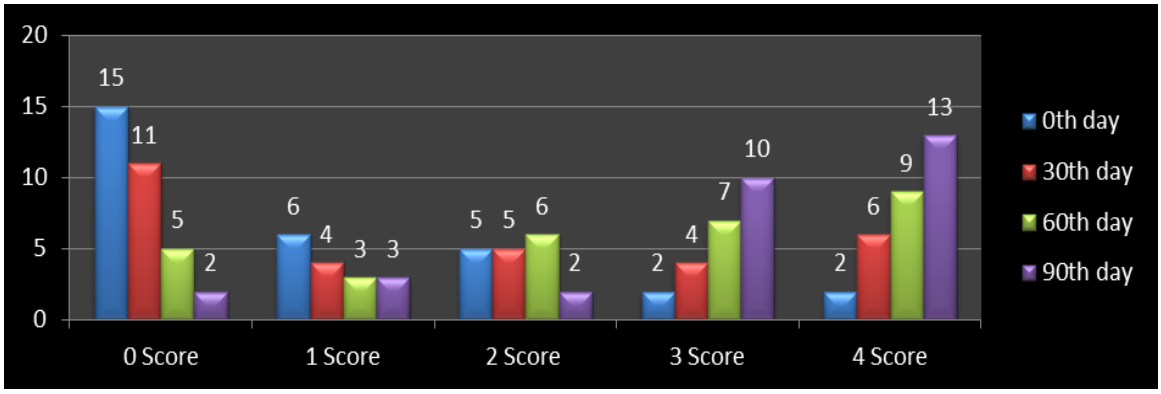
From the above table 53.50% of children had score-0 on 0th day and 4% of children had on 90th day. 20% of children had Score-1 on 0th day and 6.60% of children had on 90th day. 13% of children had Score-2 on 0th day and 10% of children had on 90th day. 3.50% of children had score-3 on 0th day and 37% of children had on 90th day. 10% of children had score-4 on 0th Day and 43% of children had on 90th day.

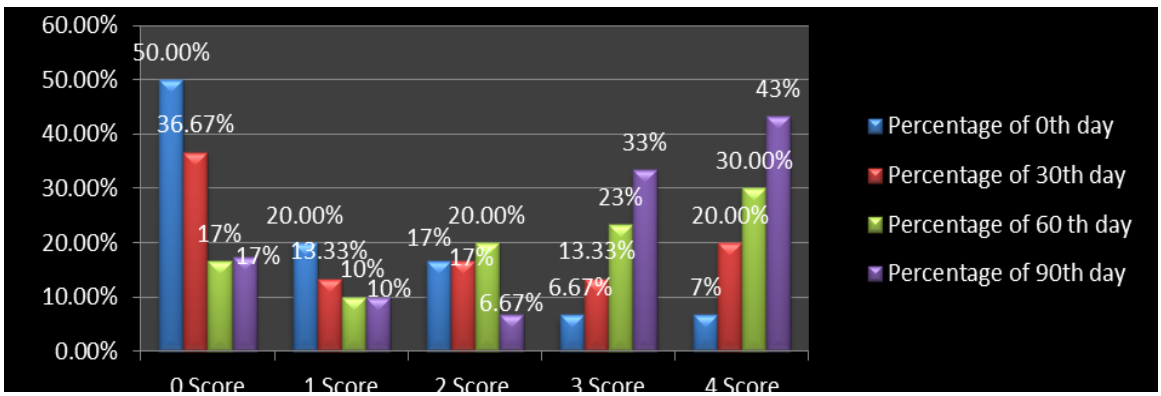
SOCIAL RELATIONSHIP AND RECIPROCITY

Table 5.5.15.3 Frequency and percentage distribution of solitary and repetitive activities:

SOLITARY AND REPETITIVE ACTIVITIES								
Score	**0th day**		**30th day**		**60th day**		**90th day**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
0	15	50.00%	11	36.67%	5	17%	2	17%
1	6	20.00%	4	13.33%	3	10.00%	3	10.00%
2	5	17%	5	17%	6	20.00%	2	6.67%
3	2	6.67%	4	13.33%	7	23%	10	33%
4	2	7%	6	20.00%	9	30.00%	13	43%

Fig 5.5.15.3 Frequency and percentage distribution of solitary and repetitive activities::





Inference:

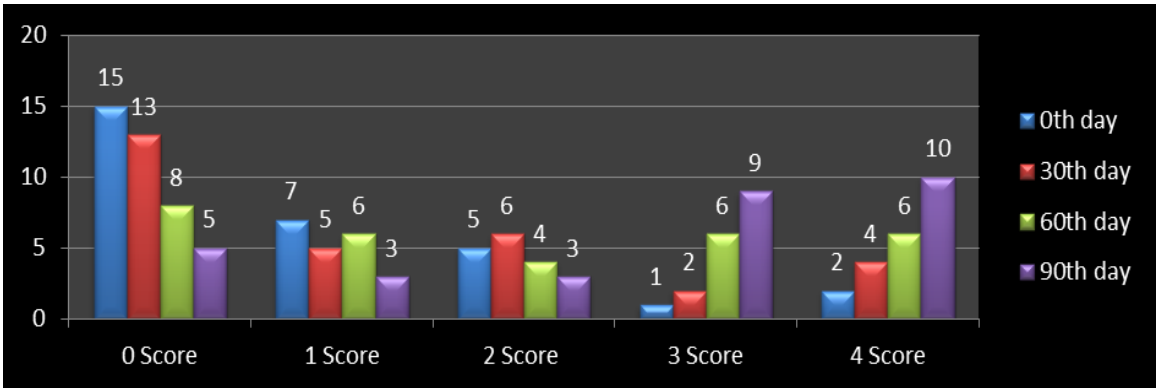
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 20% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 6.67% of children had on 90th day. 6.67% of children had score-3 on 0th day and 33% of children had on 90th day. 7% of children had score-4 on 0th Day and 43% of children had on 90th day.

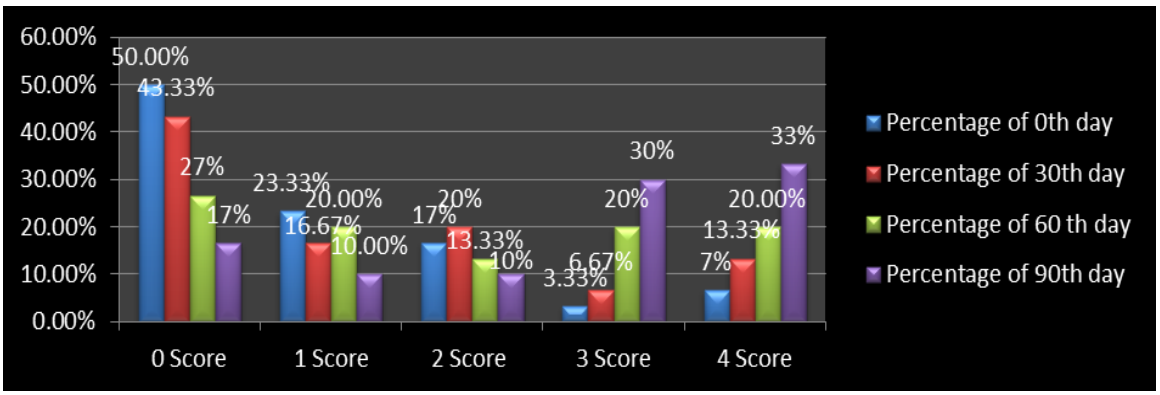
SOCIAL RELATIONSHIP AND RECIPROCITY

Table 5.5.15.4 Frequency and percentage distribution of social interaction:

SOCIAL INTERACTION								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	13	43.33%	8	27%	5	17%
1	7	23.33%	5	16.67%	6	20.00%	3	10.00%
2	5	17%	6	20%	4	13.33%	3	10.00%
3	1	3.33%	2	6.67%	6	20%	9	30%
4	2	7%	4	13.33%	6	20.00%	10	33%

Fig 5.5.15.4 Frequency and percentage distribution of social interaction:





Inference:

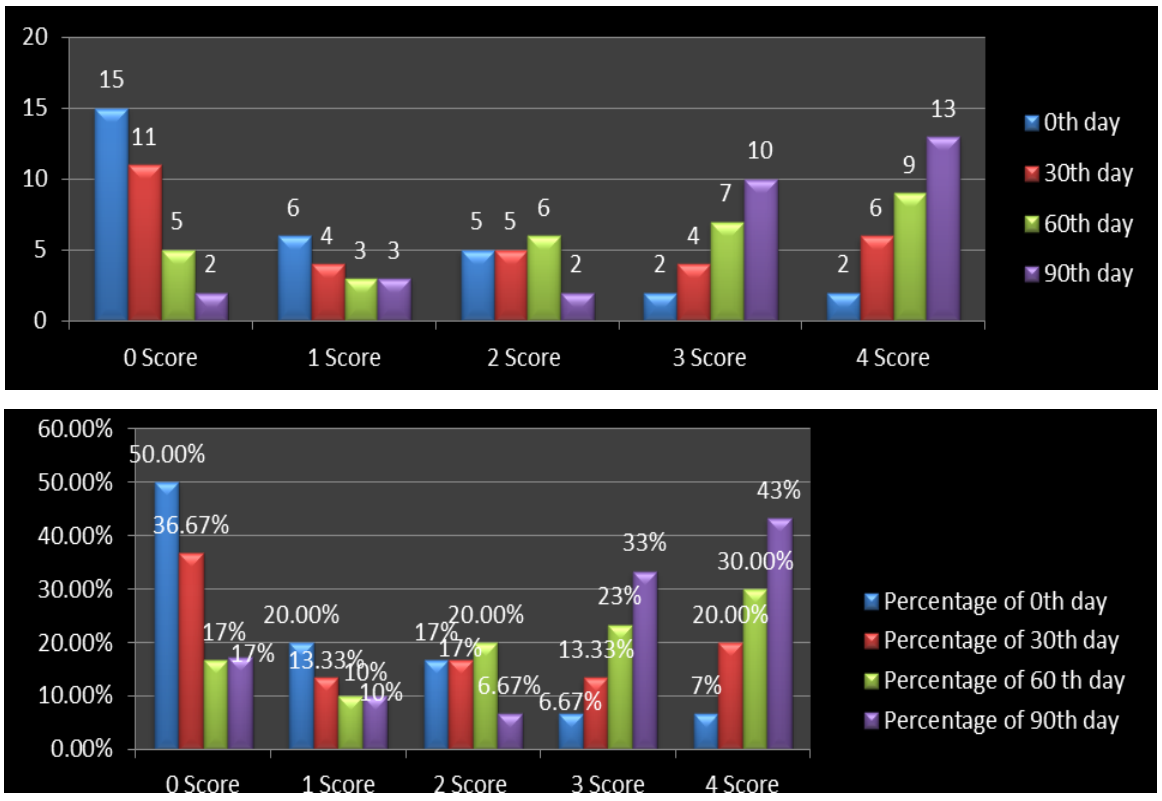
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 23.33% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 10% of children had on 90th day. 3.33% of children had score-3 on 0th day and 30% of children had on 90th day. 7% of children had score-4 on 0th Day and 33% of children had on 90th day.

SOCIAL RELATIONSHIP AND RECIPROCITY

Table 5.5.15.5 Frequency and percentage distribution of peer relationship:

PEER RELATIONSHIP								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	11	36.67%	5	17%	2	17%
1	6	20.00%	4	13.33%	3	10.00%	3	10.00%
2	5	17%	5	17%	6	20.00%	2	6.67%
3	2	6.67%	4	13.33%	7	23%	10	33%
4	2	7%	6	20.00%	9	30.00%	13	43%

Fig 5.5.15.5 Frequency and percentage distribution of peer relationship:



Inference:

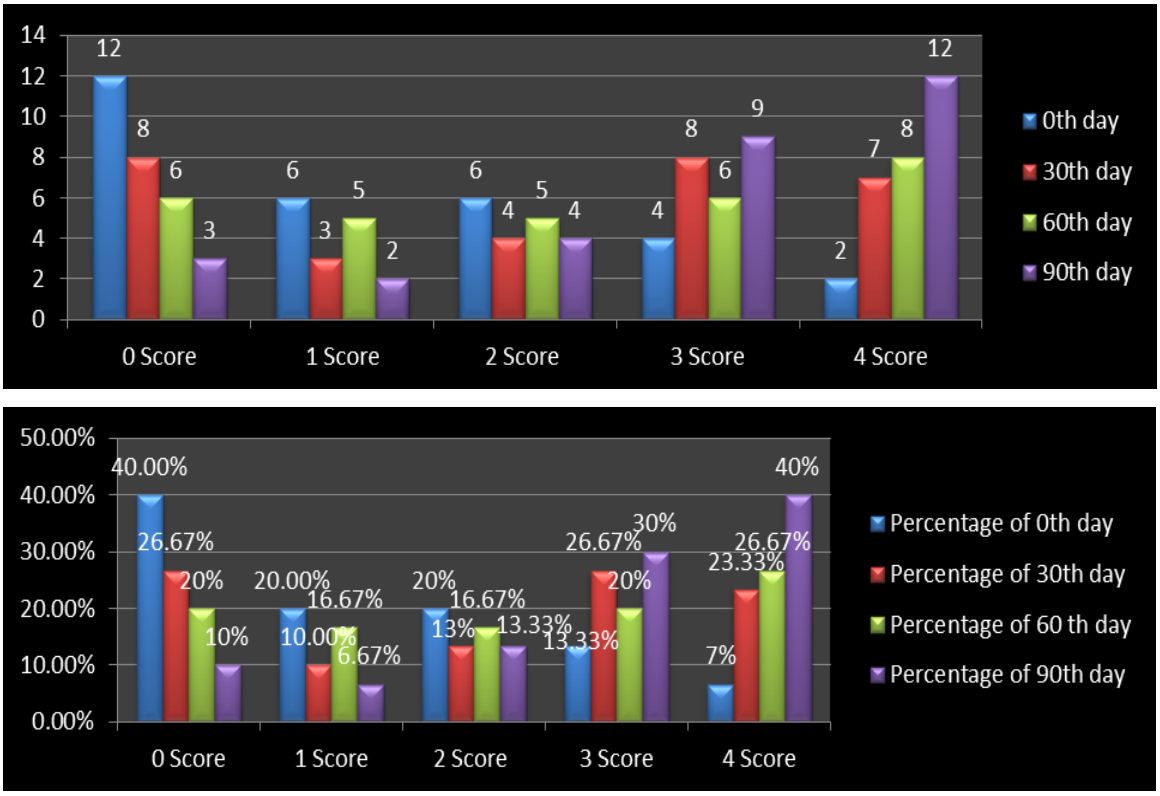
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 20% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 6.67% of children had on 90th day. 6.67% of children had score-3 on 0th day and 33% of children had on 90th day. 7% of children had score-4 on 0th Day and 43% of children had on 90th day.

EMOTIONAL RESPONSIVENESS

Table 5.5.15.6. Frequency and percentage distribution of emotional responsiveness:

INAPPROPRIATE EMOTIONAL RESPONSIVENESS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	12	40.00%	8	26.67%	6	20%	3	10%
1	6	20.00%	3	10.00%	5	16.67%	2	6.67%
2	6	20%	4	13%	5	16.67%	4	13.33%
3	4	13.33%	8	26.67%	6	20%	9	30%
4	2	7%	7	23.33%	8	26.67%	12	40%

Fig 5.5.15.6. Frequency and percentage distribution of emotional responsiveness:



Inference:

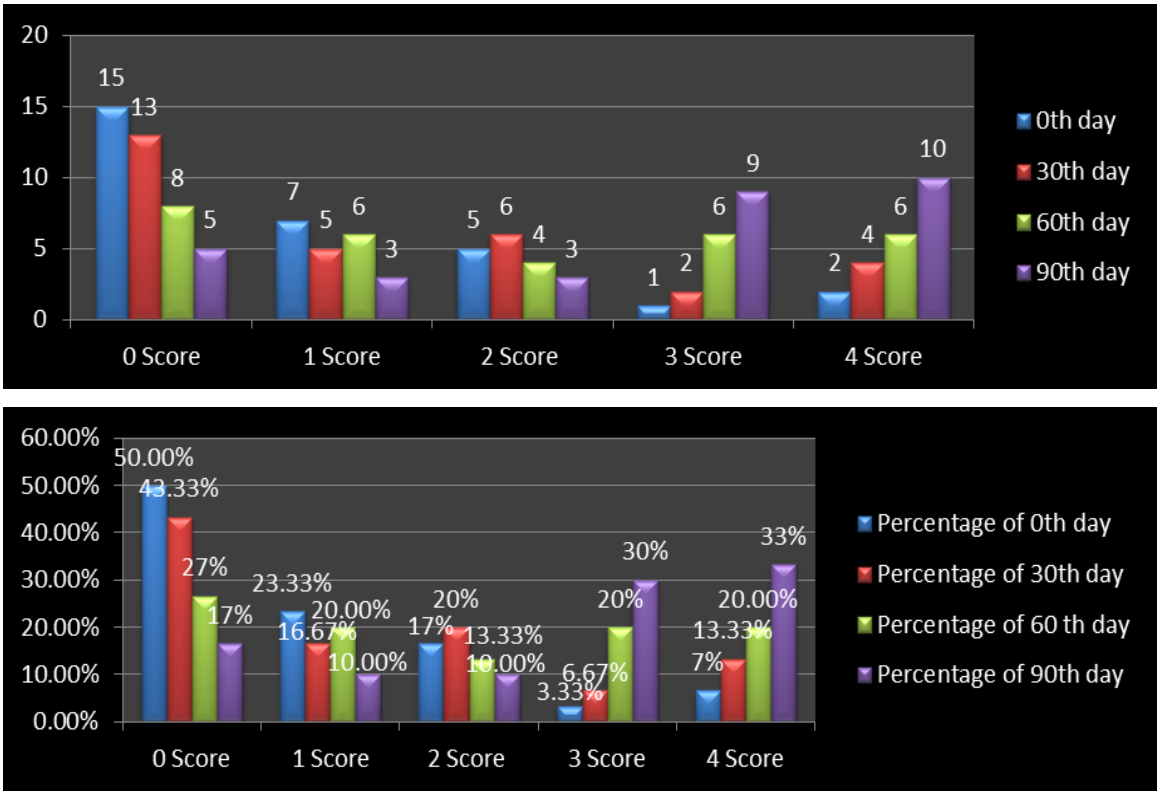
From the above table 40% of children had score-0 on 0th day and 10% of children had on 90th day. 20% of children had Score-1 on 0th day and 6.67% of children had on 90th day. 20% of children had Score-2 on 0th day and 13.33% of children had on 90th day. 13.33% of children had score-3 on 0th day and 30% of children had on 90th day. 7% of children had score-4 on 0th Day and 40% of children had on 90th day.

5.5.15.7. EMOTIONAL RESPONSIVENESS

Table 5.5.15.7.Frequency and percentage distribution of exaggerated emotions:

EXAGGERATED EMOTIONS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	13	43.33%	8	27%	5	17%
1	7	23.33%	5	16.67%	6	20.00%	3	10.00%
2	5	17%	6	20%	4	13.33%	3	10.00%
3	1	3.33%	2	6.67%	6	20%	9	30%
4	2	7%	4	13.33%	6	20.00%	10	33%

Fig 5.5.15.7. Frequency and percentage distribution of exaggerated emotions:



Inference:

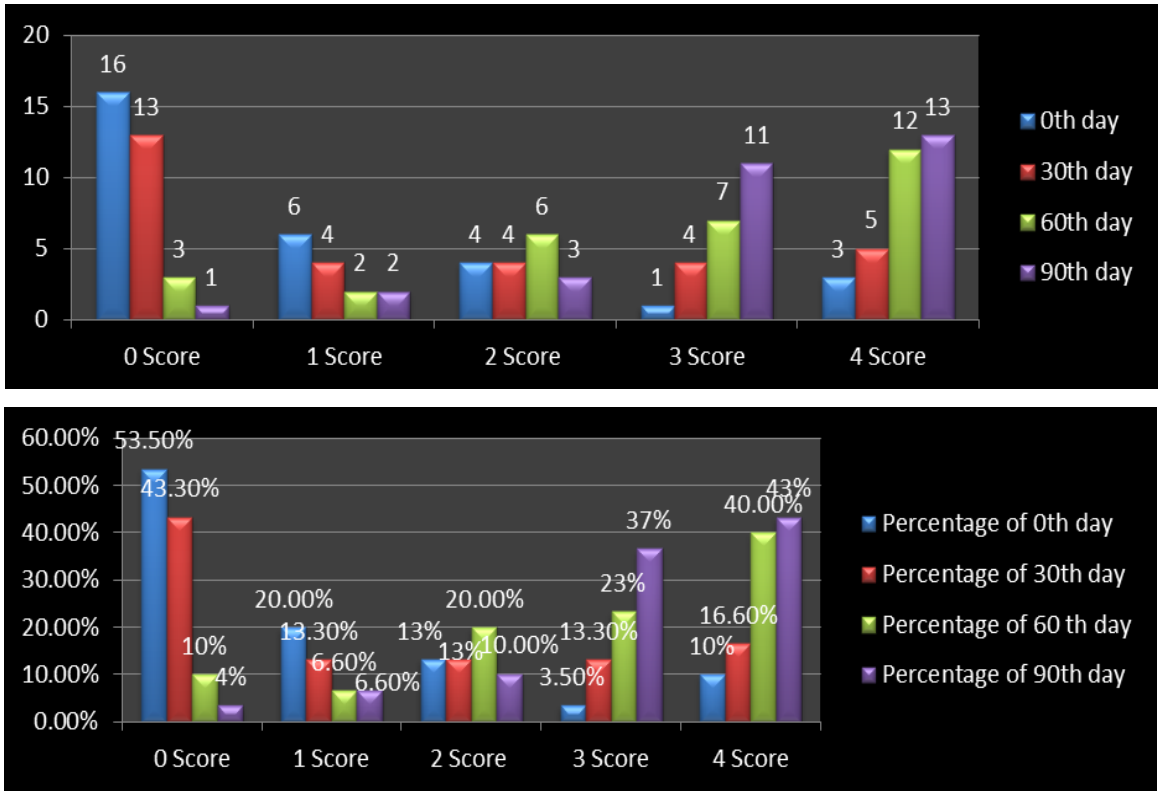
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 23.33% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 10% of children had on 90th day. 3.33% of children had score-3 on 0th day and 3% of children had on 90th day. 7% of children had score-4 on 0th Day and 33% of children had on 90th day.

EMOTIONAL RESPONSIVENESS

Table 5.5.15.8. Frequency and percentage distribution of self-stimulating emotions:

SELF-STIMULATING EMOTIONS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	16	53.50%	13	43.30%	3	10%	1	4%
1	6	20.00%	4	13.30%	2	6.60%	2	6.60%
2	4	13%	4	13%	6	20.00%	3	10.00%
3	1	3.50%	4	13.30%	7	23%	11	37%
4	3	10%	5	16.60%	12	40.00%	13	43%

Fig 5.5.15.8. Frequency and percentage distribution of self-stimulating emotions:



Inference:

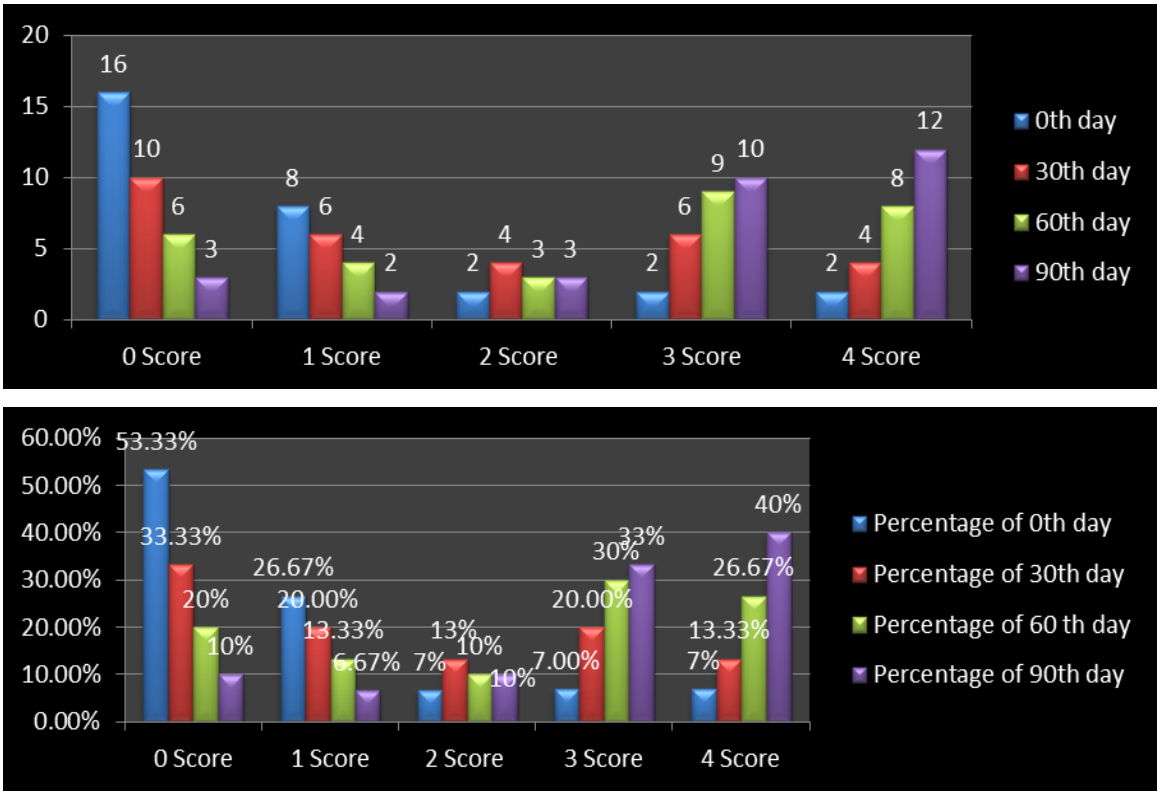
From the above table 53.5% of children had score-0 on 0th day and 4% of children had on 90th day. 20% of children had Score-1 on 0th day and 6.60% of children had on 90th day. 13.3% of children had Score-2 on 0th day and 10% of children had on 90th day. 3.50% of children had score-3 on 0th day and 37% of children had on 90th day. 10% of children had score-4 on 0th Day and 43% of children had on 90th day.

EMOTIONAL RESPONSIVENESS

Table 5.5.15.9.Frequency and percentage distribution of fear for danger:

FEAR FOR DANGER								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	16	53.33%	10	33.33%	6	20%	3	10%
1	8	26.67%	6	20.00%	4	13.33%	2	6.67%
2	2	7%	4	13%	3	10.00%	3	10.00%
3	2	7.00%	6	20.00%	9	30%	10	33%
4	2	7%	4	13.33%	8	26.67%	12	40%

Fig 5.5.15.9. Frequency and percentage distribution of fear for danger:



Inference:

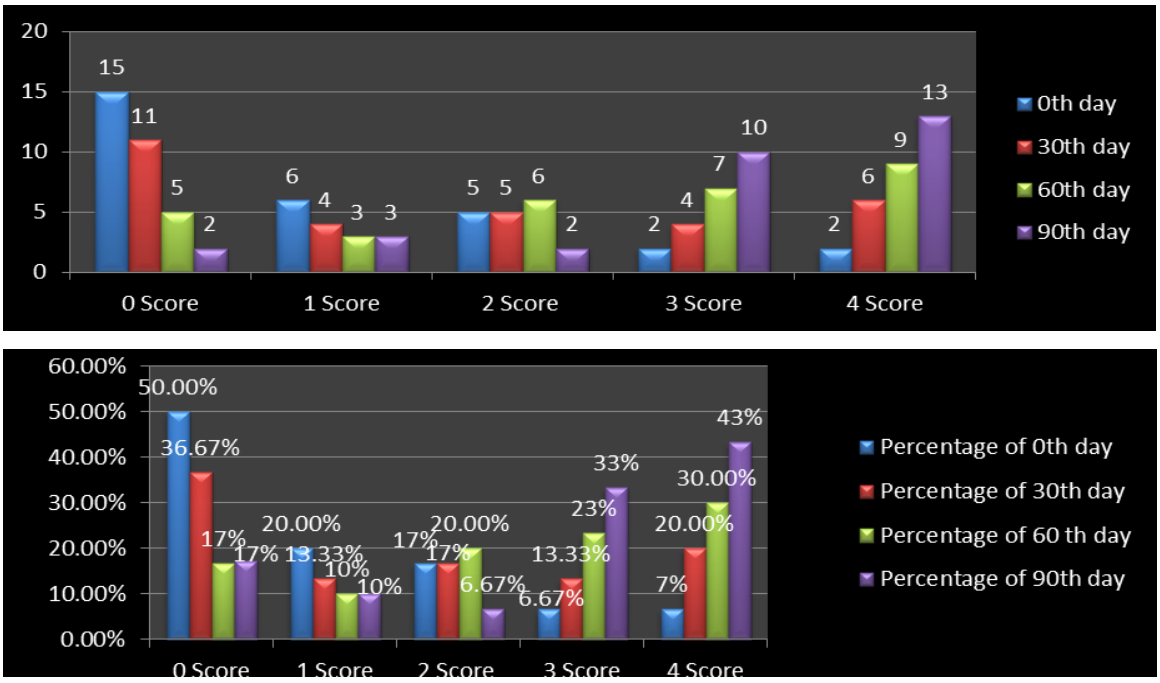
From the above table 53.3% of children had score-0 on 0th day and 10% of children had on 90th day. 26.67% of children had Score-1 on 0th day and 6.67% of children had on 90th day. 7% of children had Score-2 on 0th day and 10% of children had on 90th day. 7% of children had score-3 on 0th day and 33% of children had on 90th day. 7% of children had score-4 on 0th Day and 40% of children had on 90th day.

EMOTIONAL RESPONSIVENESS

Table 5.5.15.10 Frequency and percentage distribution of excited for no apparent reasons:

EXCITED FOR NO APPARENT REASONS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	11	36.67%	5	17%	2	17%
1	6	20.00%	4	13.33%	3	10.00%	3	10.00%
2	5	17%	5	17%	6	20.00%	2	6.67%
3	2	6.67%	4	13.33%	7	23%	10	33%
4	2	7%	6	20.00%	9	30.00%	13	43%

Fig 5.5.15.10Frequency and percentage distribution of excited for no apparent reasons:



Inference:

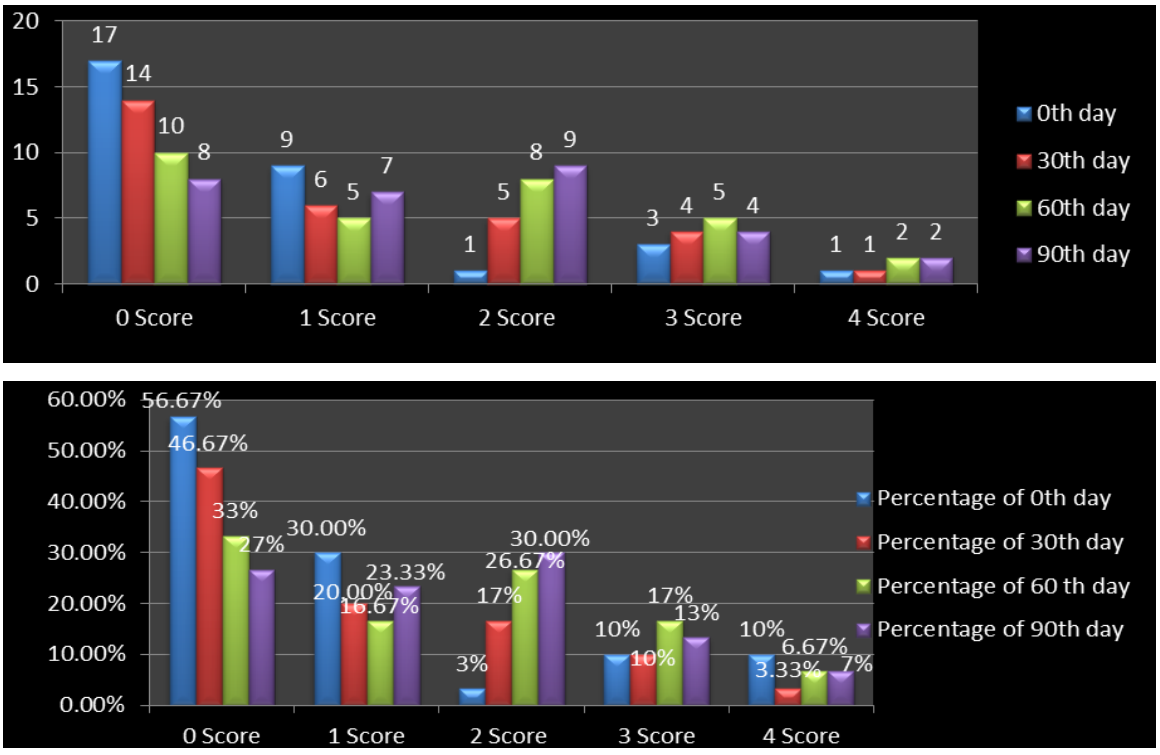
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 20% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 6.67% of children had on 90th day. 6.67% of children had score-3 on 0th day and 33% of children had on 90th day. 7% of children had score-4 on 0th Day and 43% of children had on 90th day.

SPEECH: LANGUAGE AND COMMUNICATION

Table 5.5.15.11. Frequency and percentage distribution of Non-verbal language to communicate the others

NON-VERBAL LANGUAGE TO COMMUNICATE								
Score	**0th day**		**30th day**		**60th day**		**90th day**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
0	17	56.67%	14	46.67%	10	33%	8	27%
1	9	30.00%	6	20.00%	5	16.67%	7	23.33%
2	1	3%	5	17%	8	26.67%	9	30.00%
3	3	10.00%	4	10.00%	5	17%	4	13%
4	1	10%	1	3.33%	2	6.67%	2	7%

Fig 5.5.15.11. Frequency and percentage distribution of Non verbal language to communicate



Inference:

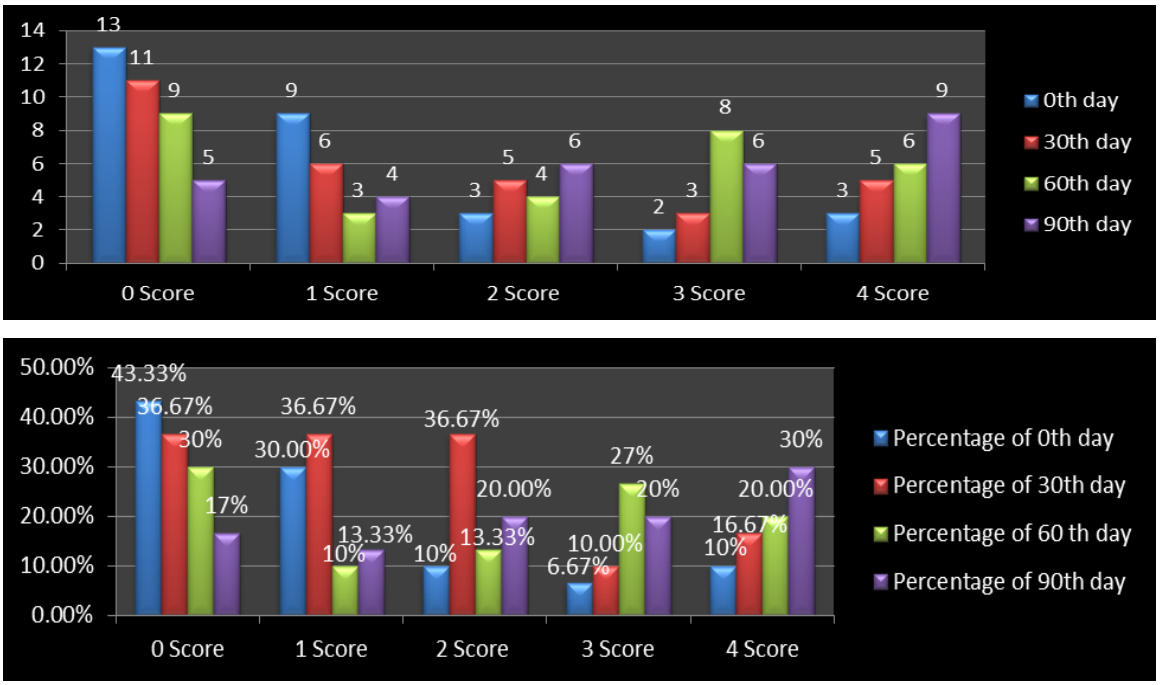
From the above table 56.67% of children had score-0 on 0th day and 27% of children had on 90th day. 30% of children had Score-1 on 0th day and 23.33% of children had on 90th day. 3% of children had Score-2 on 0th day and 30% of children had on 90th day. 10% of children had score-3 on 0th day and 17% of children had on 90th day. 10% of children had score-4 on 0th Day and 7% of children had on 90th day.

SPEECH: LANGUAGE AND COMMUNICATION

Table 5.5.15.12 Frequency and percentage distribution of Stereotyped and repetitive use of language

STEREOTYPED AND REPETITIVE USE OF LANGUAGE								
Score	**0th day**		**30th day**		**60th day**		**90th day**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
0	13	43.33%	11	36.67%	9	30%	5	17%
1	9	30.00%	6	36.67%	3	10.00%	4	13.33%
2	3	10%	5	36.67%	4	13.33%	6	20.00%
3	2	6.67%	3	10.00%	8	27%	6	20%
4	3	10%	5	16.67%	6	20.00%	9	30%

Fig 5.5.15.12Frequency and percentage distribution of Stereotyped and repetitive use of language:



Inference:

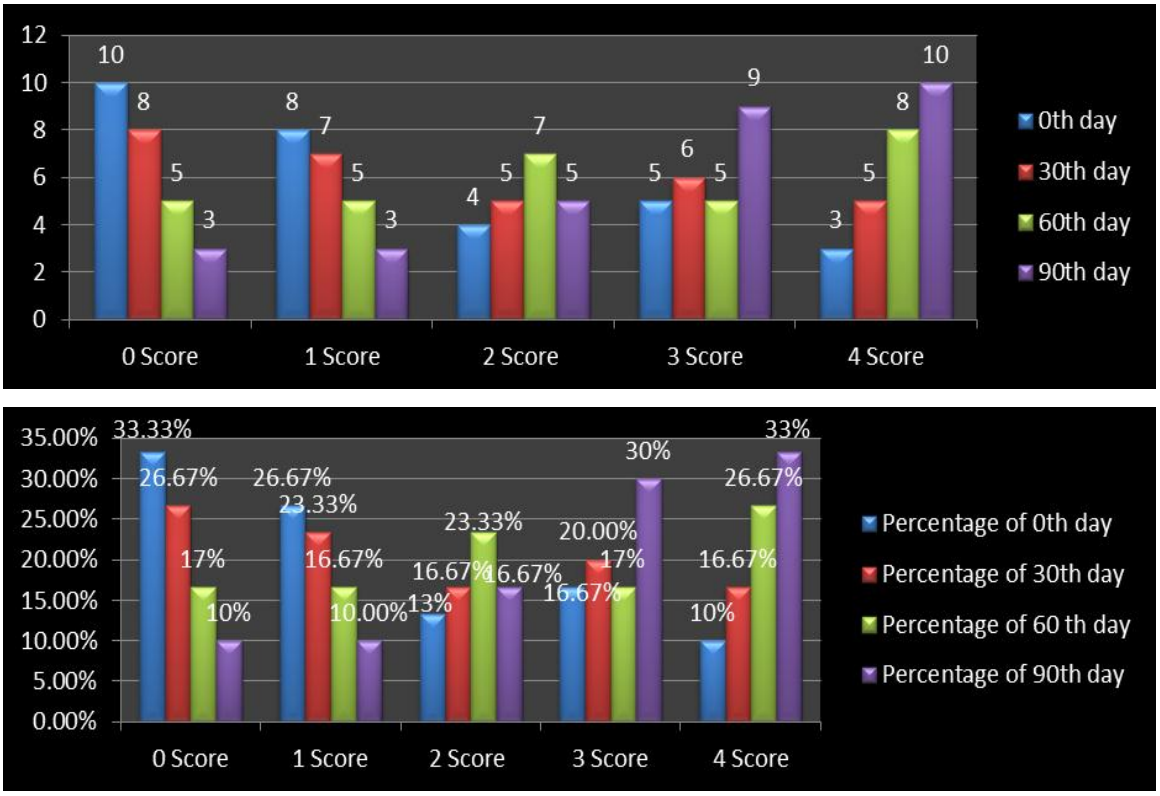
From the above table 43.33% of children had score-0 on 0th day and 17% of children had on 90th day. 30% of children had Score-1 on 0th day and 13.33% of children had on 90th day. 10% of children had Score-2 on 0th day and 20% of children had on 90th day. 6.67% of children had score-3 on 0th day and 20% of children had on 90th day. 10% of children had score-4 on 0th Day and 30% of children had on 90th day.

SPEECH: LANGUAGE AND COMMUNICATION

Table 5.5.15.13 Frequency and percentage distribution of unusual noises:

UNUSUAL NOISES								
Score	**0th day**		**30th day**		**60th day**		**90th day**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
0	10	33.33%	8	26.67%	5	17%	3	10%
1	8	26.67%	7	23.33%	5	16.67%	3	10.00%
2	4	13%	5	16.67%	7	23.33%	5	16.67%
3	5	16.67%	6	20.00%	5	17%	9	30%
4	3	10%	5	16.67%	8	26.67%	10	33%

Fig 5.5.15.13Frequency and percentage distribution of unusual noises:



Inference:

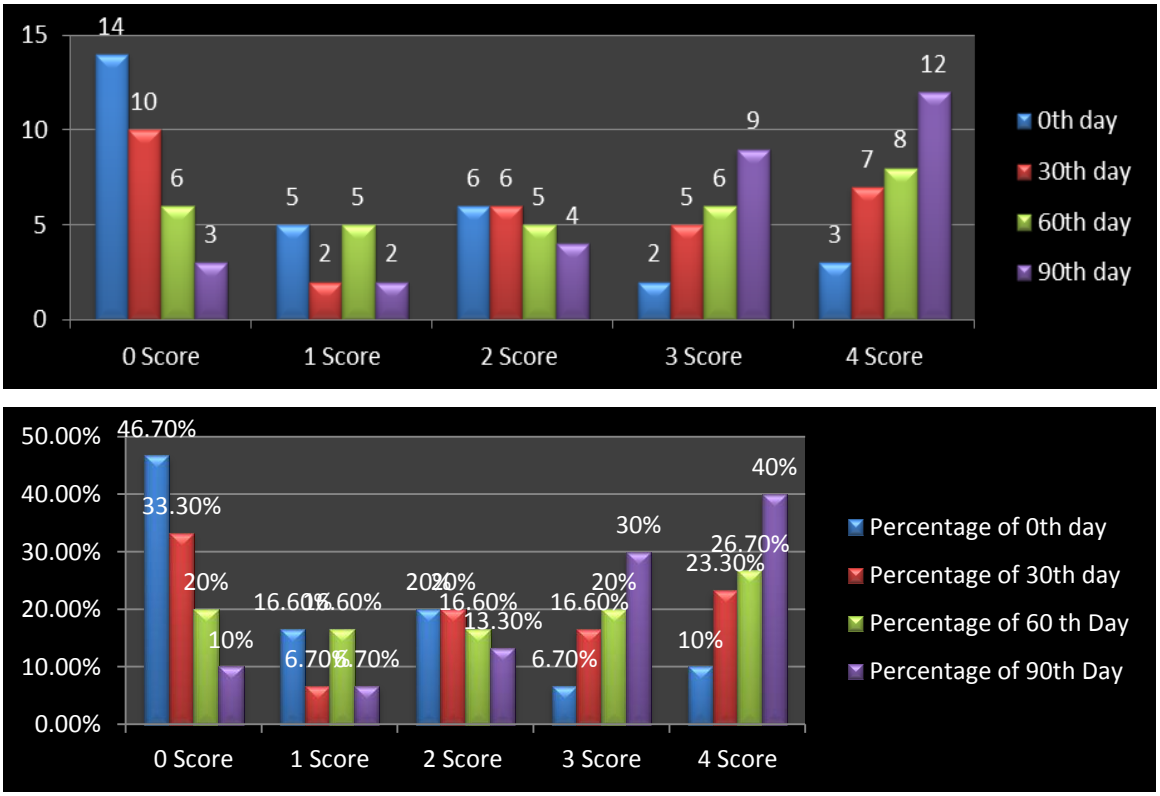
From the above table3 3.33% of children had score-0 on 0th day and 10% of children had on 90th day. 26.67% of children had Score-1 on 0th day and 10% of children had on 90th day. 13% of children had Score-2 on 0th day and 23% of children had on 90th day. 16.67% of children had score-3 on 0th day and 30% of children had on 90th day. 10% of children had score-4 on 0th Day and 33% of children had on 90th day.

SPEECH: LANGUAGE AND COMMUNICATION

Table 5.5.15.14. Frequency and percentage distribution of Meaningless words:

MEANINGLESS WORDS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	14	46.70%	10	33.30%	6	20%	3	10%
1	5	16.60%	2	6.70%	5	16.60%	2	6.70%
2	6	20%	6	20%	5	16.60%	4	13.30%
3	2	6.70%	5	16.60%	6	20%	9	30%
4	3	10%	7	23.30%	8	26.70%	12	40%

Fig 5.5.15.14 Frequency and percentage distribution of meaningless words:



Inference:

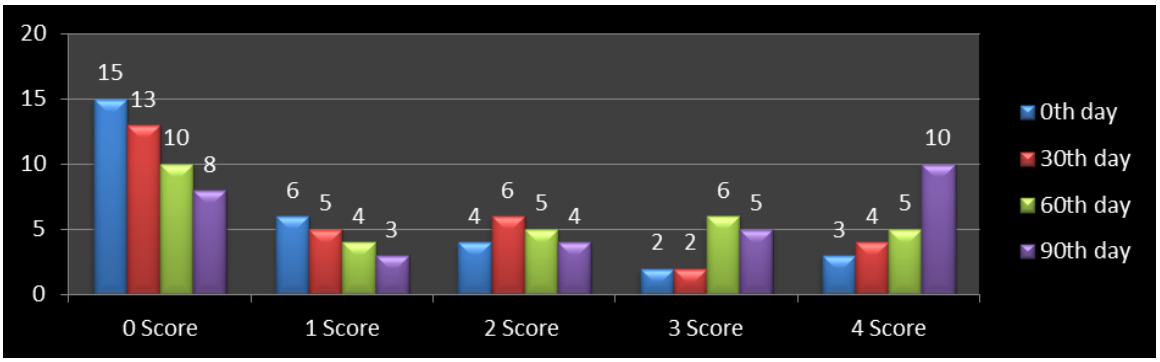
From the above table 46.7% of children had score-0 on 0th day and 10% of children had on 90th day. 16.6% of children had Score-1 on 0th day and 6.7% of children had on 90th day. 20% of children had Score-2 on 0th day and 13.30% of children had on 90th day. 6.70% of children had score-3 on 0th day and 30% of children had on 90th day. 10% of children had score-4 on 0th Day and 40% of children had on 90th day

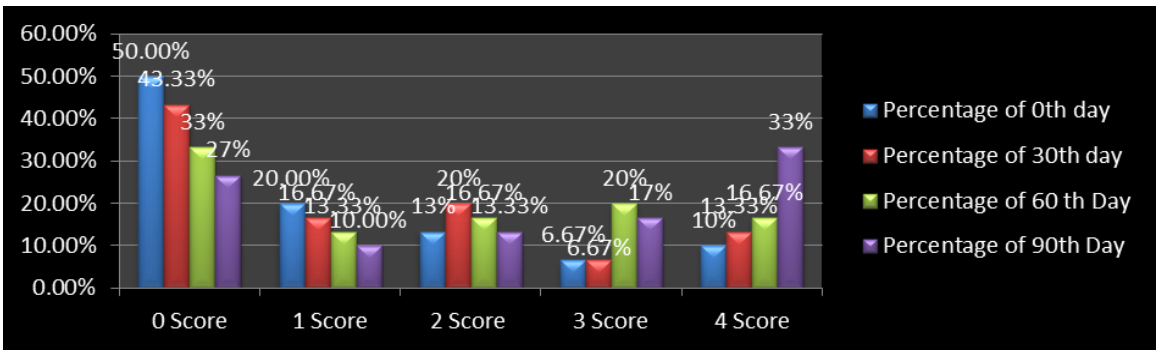
SPEECH: LANGUAGE AND COMMUNICATION

Table 5.5.15.15. Frequency and percentage distribution to understand the communication:

TO UNDERSTAND THE COMMUNICATION								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	13	43.33%	10	33%	8	27%
1	6	20.00%	5	16.67%	4	13.33%	3	10.00%
2	4	13%	6	20%	5	16.67%	4	13.33%
3	2	6.67%	2	6.67%	6	20%	5	17%
4	3	10%	4	13.33%	5	16.67%	10	33%

Fig 5.5.15.15. Frequency and percentage distribution to understand the communication





Inference:

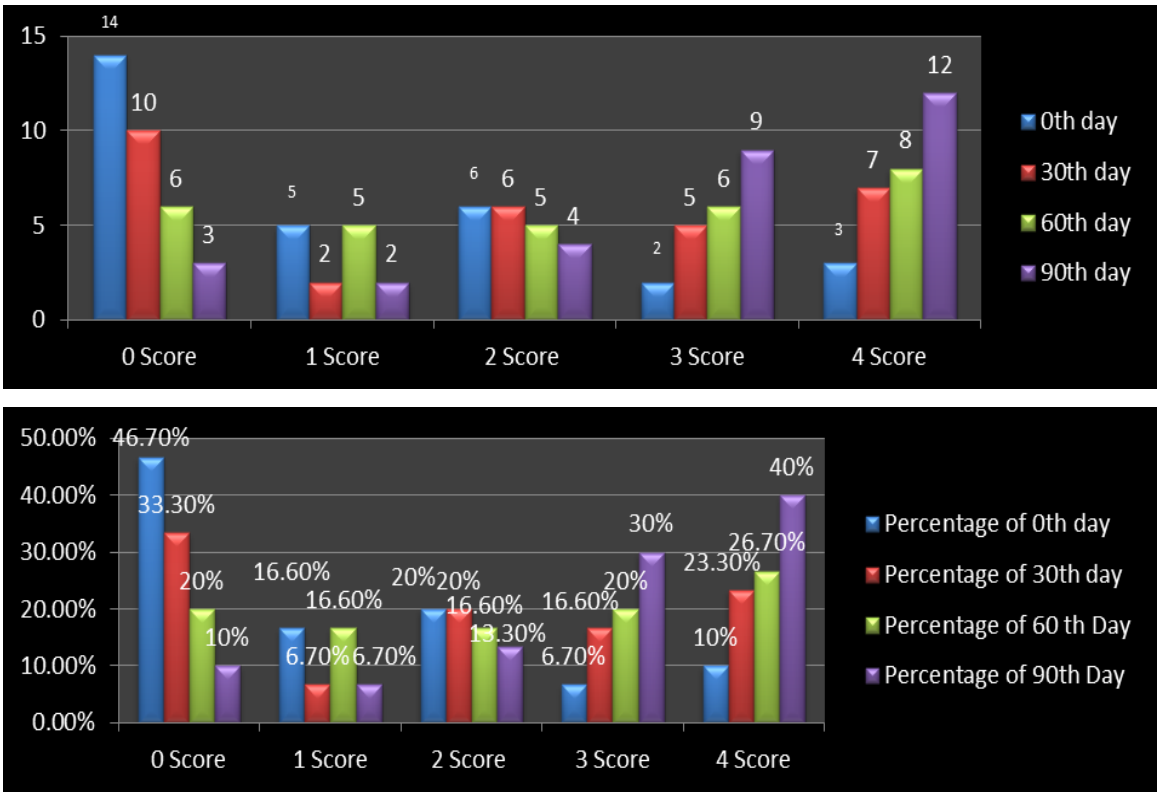
From the above table 50% of children had score-0 on 0th day and 27% of children had on 90th day. 20% of children had Score-1 on 0th day and 10% of children had on 90th day. 13% of children had Score-2 on 0th day and 13.33% of children had on 90th day. 6.67% of children had score-3 on 0th day and 17% of children had on 90th day. 10% of children had score-4 on 0th Day and 33% of children had on 90th day.

BEHAVIOURAL PATTERNS

Table 5.5.15.16 Frequency distribution of hyperactivity and restlessness:

HYPERACTIVITY AND RESTLESSNESS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	14	46.70%	10	33.30%	6	20%	3	10%
1	5	16.60%	2	6.70%	5	16.60%	2	6.70%
2	6	20%	6	20%	5	16.60%	4	13.30%
3	2	6.70%	5	16.60%	6	20%	9	30%
4	3	10%	7	23.30%	8	26.70%	12	40%

Fig 5.5.15.16 Frequency and percentage distribution of hyperactivity and restlessness:



Inference:

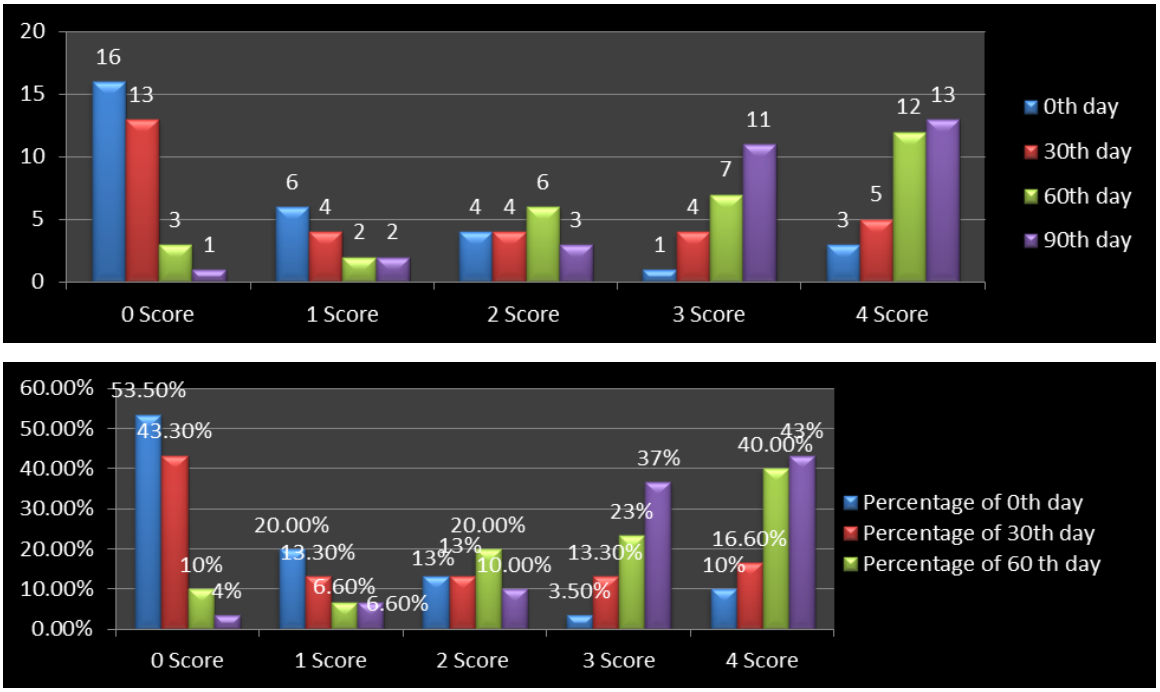
From the above table 46.7% of children had score-0 on 0th day and 10% of children had on 90th day. 16.60 % of children had Score-1 on 0th day and 6.70% of children had on 90th day. 20% of children had Score-2 on 0th day and 13.30% of children had on 90th day. 6.70% of children had score-3 on 0th day and 30% of children had on 90th day. 10% of children had score-4 on 0th Day and 40% of children had on 90th day.

BEHAVIOURAL PATTERNS

Table 5.5.15.17. Frequency and percentage distribution of aggressive behaviour:

AGGRESSIVE BEHAVIOUR								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	16	53.50%	13	43.30%	3	10%	1	4%
1	6	20.00%	4	13.30%	2	6.60%	2	6.60%
2	4	13%	4	13%	6	20.00%	3	10.00%
3	1	3.50%	4	13.30%	7	23%	11	37%
4	3	10%	5	16.60%	12	40.00%	13	43%

Fig 5.5.15.17 Frequency and percentage distribution of aggressive behaviour:



Inference:

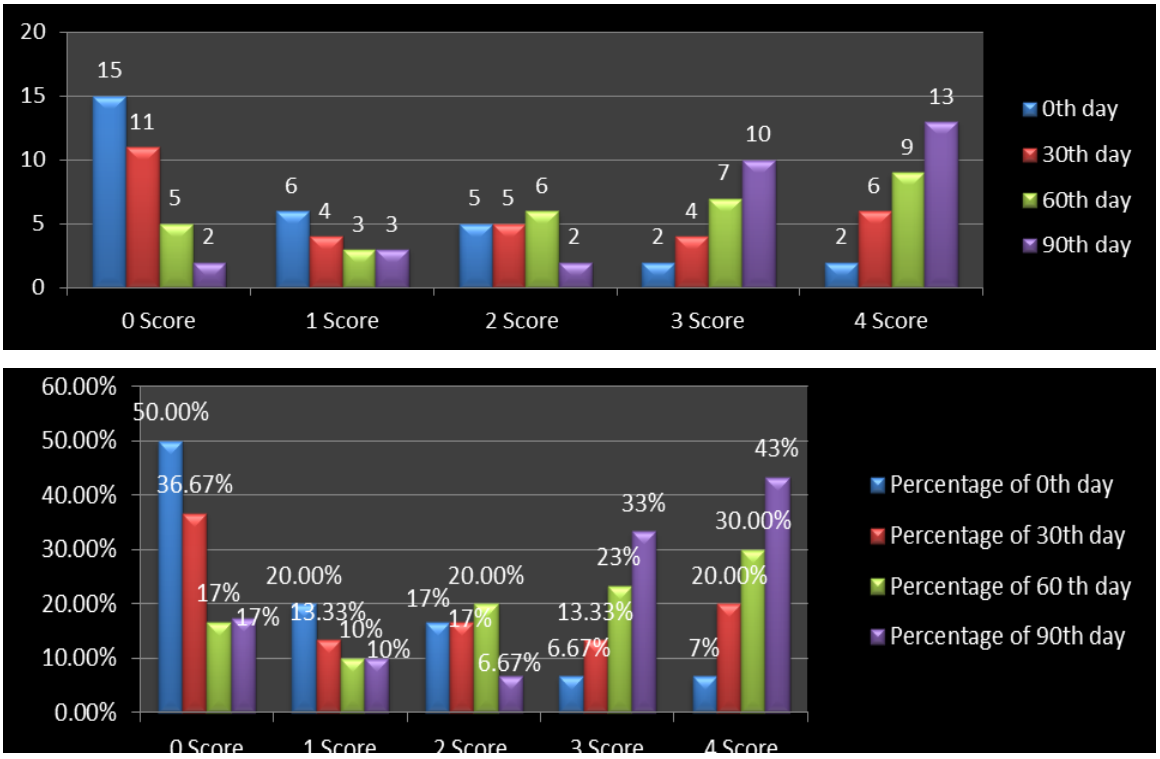
From the above table 53.50% of children had score-0 on 0th day and 4% of children had on 90th day. 20% of children had Score-1 on 0th day and 6.60% of children had on 90th day. 13% of children had Score-2 on 0th day and 10% of children had on 90th day. 3.50% of children had score-3 on 0th day and 37% of children had on 90th day. 10% of children had score-4 on 0th Day and 43% of children had on 90th day.

BEHAVIOURAL PATTERNS

Table 5.5.15.18 Frequency and percentage distribution of attachment to inanimate objects:

ATTACHMENT TO INANIMATE OBJECTS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	11	36.67%	5	17%	2	17%
1	6	20.00%	4	13.33%	3	10.00%	3	10.00%
2	5	17%	5	17%	6	20.00%	2	6.67%
3	2	6.67%	4	13.33%	7	23%	10	33%
4	2	7%	6	20.00%	9	30.00%	13	43%

Fig 5.5.15.18 Frequency and percentage distribution of attachment to inanimate objects:



Inference:

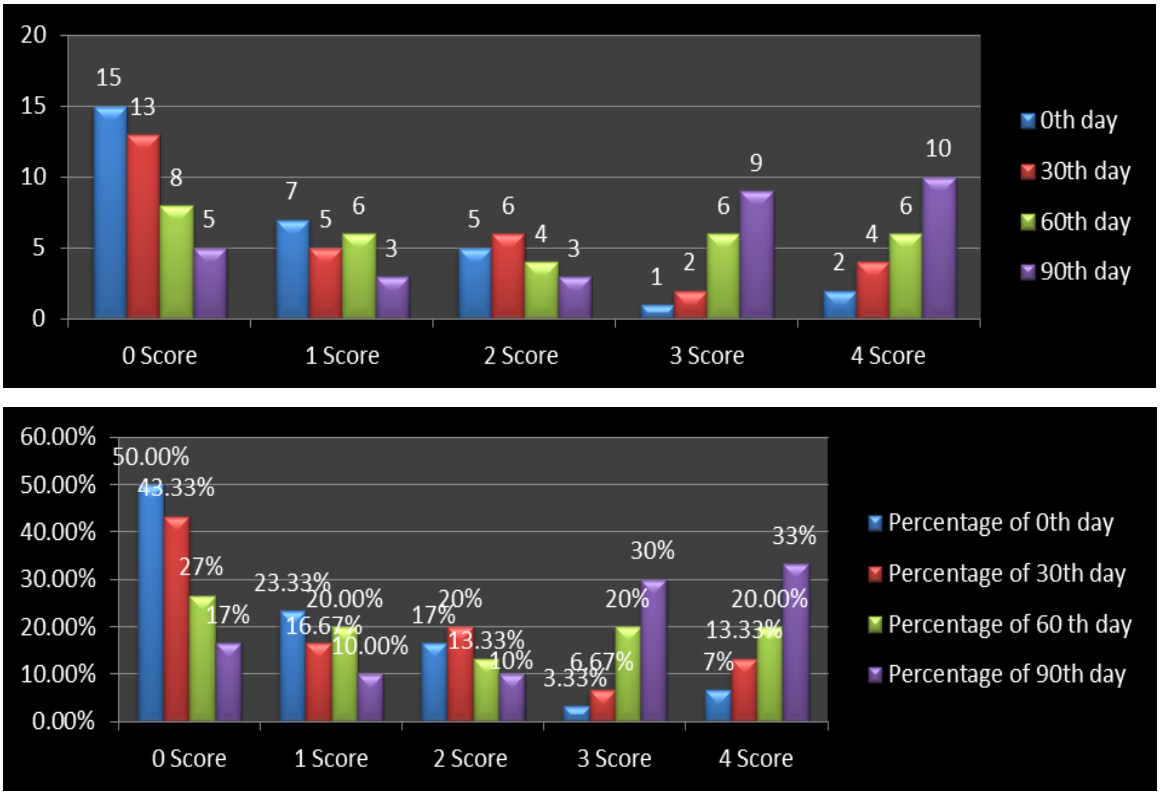
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 20% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 6.67% of children had on 90th day. 6.67% of children had score-3 on 0th day and 33% of children had on 90th day. 7% of children had score-4 on 0th Day and 43% of children had on 90th day.

BEHAVIOURAL PATTERNS

Table 5.5.15.19 Frequency distribution of self-injurious behavior:

SELF-INJURIOUS BEHAVIOR								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	13	43.33%	8	27%	5	17%
1	7	23.33%	5	16.67%	6	20.00%	3	10.00%
2	5	17%	6	20%	4	13.33%	3	10.00%
3	1	3.33%	2	6.67%	6	20%	9	30%
4	2	7%	4	13.33%	6	20.00%	10	33%

Fig 5.5.15.19 Frequency and percentage distribution of self-injurious behaviour:



Inference:

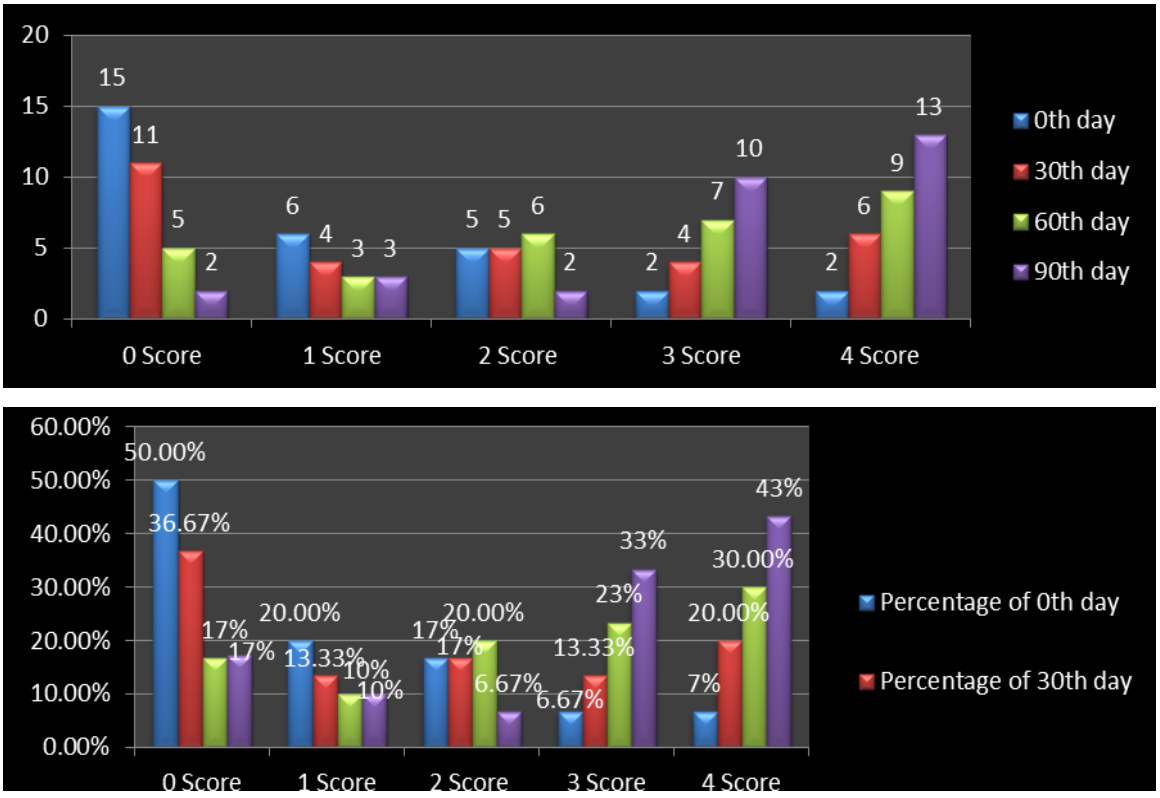
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 23.33% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 10% of children had on 90th day. 3.33% of children had score-3 on 0th day and 30% of children had on 90th day. 7% of children had score-4 on 0th Day and 33% of children had on 90th day.

BEHAVIOURAL PATTERNS

Table 5.5.15.20 Frequency and percentage distribution of temper tantrums:

TEMPER TANTRUMS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	11	36.67%	5	17%	2	17%
1	6	20.00%	4	13.33%	3	10.00%	3	10.00%
2	5	17%	5	17%	6	20.00%	2	6.67%
3	2	6.67%	4	13.33%	7	23%	10	33%
4	2	7%	6	20.00%	9	30.00%	13	43%

Fig 5.5.15.20.Frequency and percentage distribution of temper tantrums:



Inference:

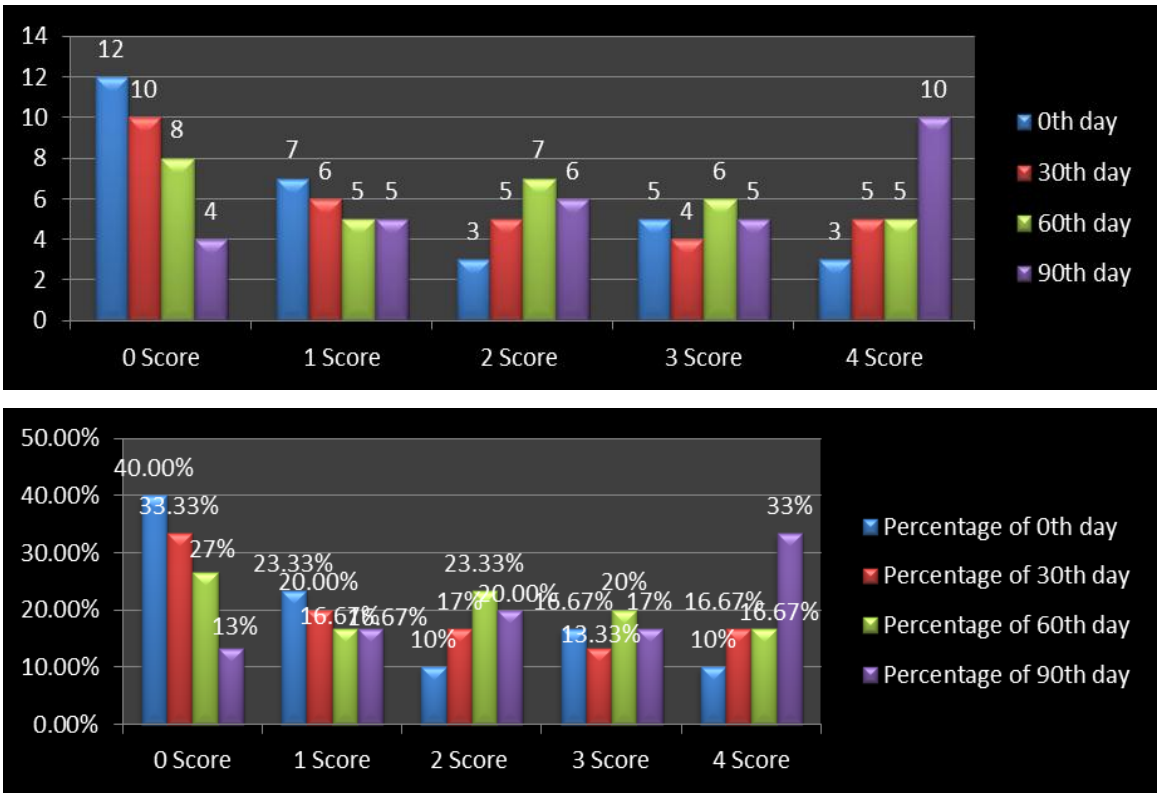
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 20% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 6.67% of children had on 90th day. 6.67% of children had score-3 on 0th day and 33% of children had on 90th day. 7% of children had score-4 on 0th Day and 43% of children had on 90th day.

SENSORY ASPECTS

Table 5.5.15.21.Frequency and percentage distribution of unusual visions

UNUSUAL VISIONS								
Score	**0th day**		**30th day**		**60th day**		**90th day**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
0	12	40.00%	10	33.33%	8	27%	4	13%
1	7	23.33%	6	20.00%	5	16.67%	5	16.67%
2	3	10%	5	17%	7	23.33%	6	20.00%
3	5	16.67%	4	13.33%	6	20%	5	17%
4	3	10%	5	16.67%	5	16.67%	10	33%

Fig 5.5.15.22. Frequency and percentage distribution of unusual visions:



Inference:

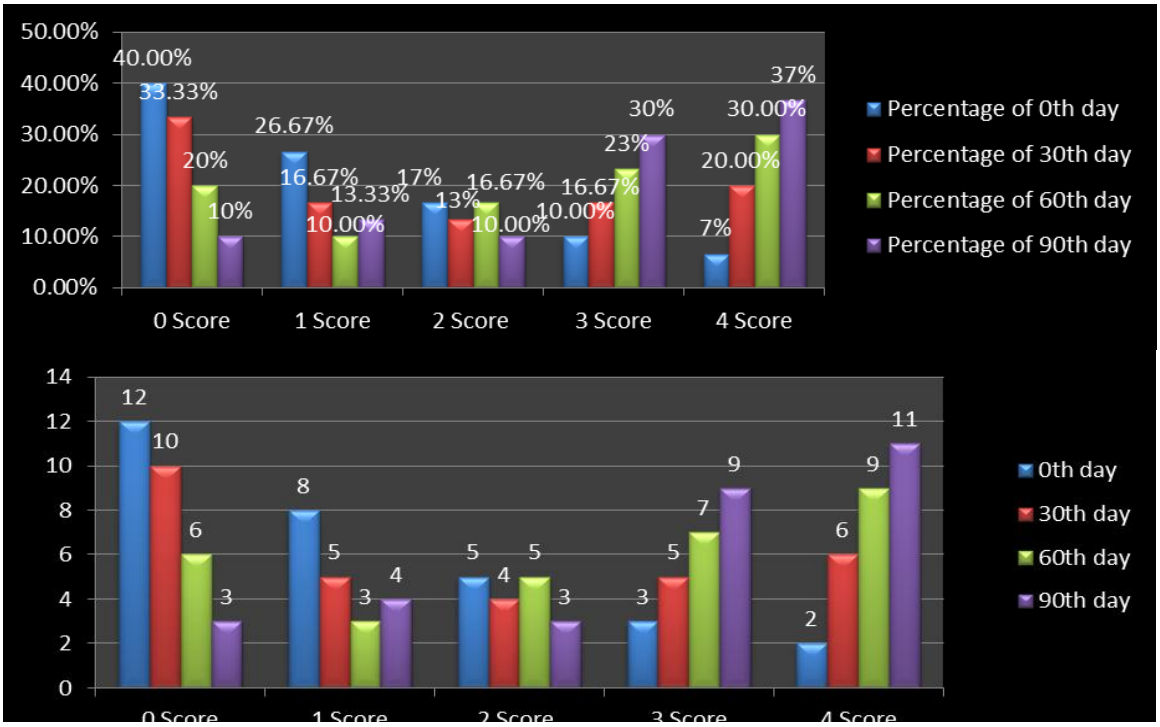
From the above table 40% of children had score-0 on 0th day and 13% of children had on 90th day. 23% of children had Score-1 on 0th day and 16.67% of children had on 90th day. 10% of children had Score-2 on 0th day and 20% of children had on 90th day. 16.67% of children had score-3 on 0th day and 17% of children had on 90th day. 10% of children had score-4 on 0th Day and 33% of children had on 90th day.

SENSORY ASPECTS

Table 5.5.15.25. Frequency and percentage distribution of stares into space for long periods of time

STARES INTO SPACE FOR LONG PERIODS OF TIME								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	12	40.00%	10	33.33%	6	20%	3	10%
1	8	26.67%	5	16.67%	3	10.00%	4	13.33%
2	5	17%	4	13%	5	16.67%	3	10.00%
3	3	10.00%	5	16.67%	7	23%	9	30%
4	2	7%	6	20.00%	9	30.00%	11	37%

Fig 5.5.15.25 Frequency and percentage distribution of stares into space for long periods of time



Inference:

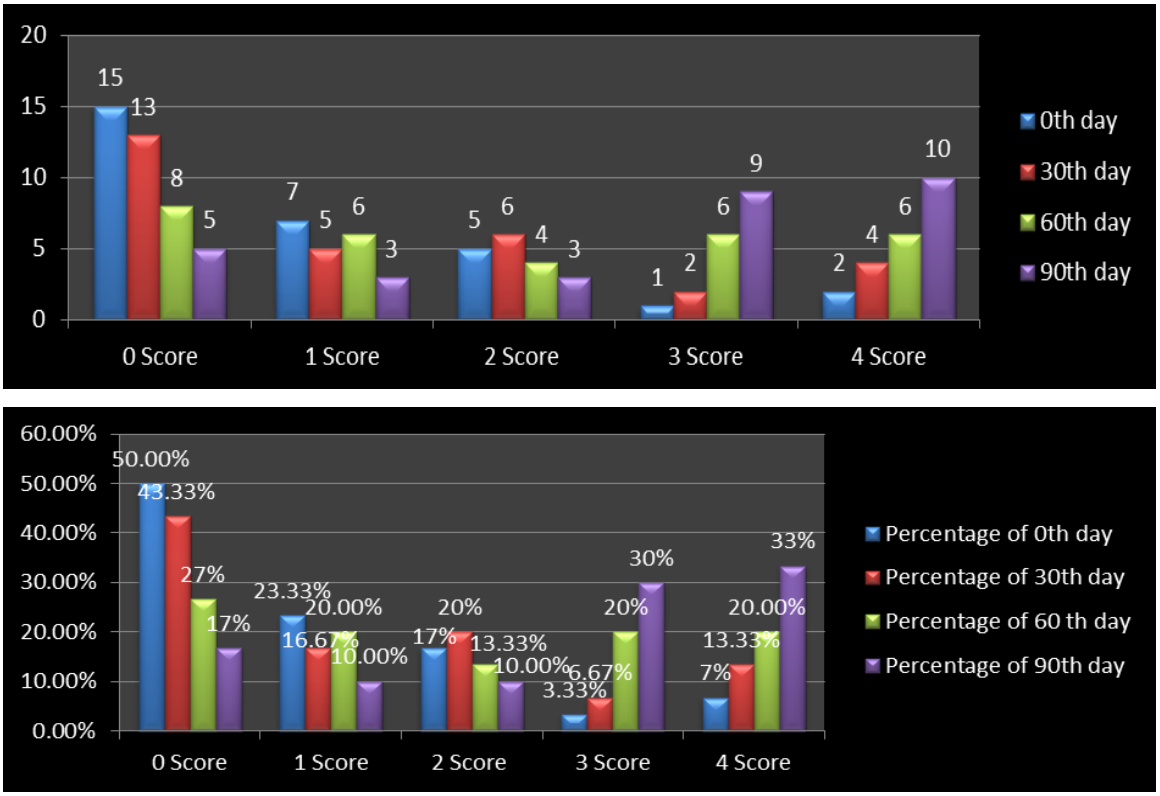
From the above table 40% of children had score-0 on 0th day and 10% of children had on 90th day. 26.67% of children had Score-1 on 0th day and 13.33% of children had on 90th day. 17% of children had Score-2 on 0th day and 10% of children had on 90th day. 10% of children had score-3 on 0th day and 30% of children had on 90th day. 7% of children had score-4 on 0th Day and 37% of children had on 90th day.

SENSORY ASPECTS

Table 5.5.15.23.Frequency and percentage distribution of insensitive to pain

INSENSITIVE TO PAIN								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	50.00%	13	43.33%	8	27%	5	17%
1	7	23.33%	5	16.67%	6	20.00%	3	10.00%
2	5	17%	6	20%	4	13.33%	3	10.00%
3	1	3.33%	2	6.67%	6	20%	9	30%
4	2	7%	4	13.33%	6	20.00%	10	33%

Fig 5.5.15.23Frequency and percentage distribution of Insensitive to pain:



Inference:

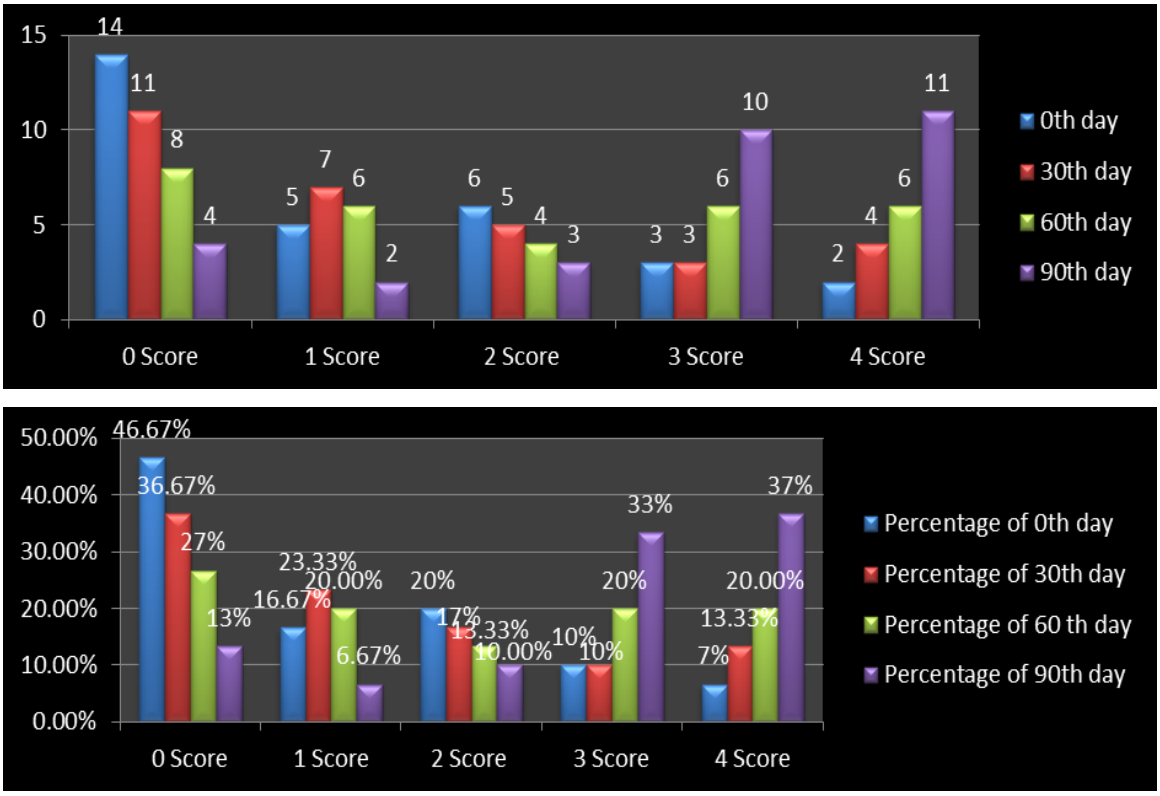
From the above table 50% of children had score-0 on 0th day and 17% of children had on 90th day. 23.33% of children had Score-1 on 0th day and 10% of children had on 90th day. 17% of children had Score-2 on 0th day and 10% of children had on 90th day. 3.33% of children had score-3 on 0th day and 30% of children had on 90th day. 7% of children had score-4 on 0th Day and 33% of children had on 90th day.

SENSORY ASPECTS

Table 5.5.15.24. Frequency and percentage distribution of responds to object

RESPONDS TO OBJECT								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	14	46.67%	11	36.67%	8	27%	4	13%
1	5	16.67%	7	23.33%	6	20.00%	2	6.67%
2	6	20%	5	17%	4	13.33%	3	10.00%
3	3	10.00%	3	10.00%	6	20%	10	33%
4	2	7%	4	13.33%	6	20.00%	11	37%

Fig 5.5.15.24. Frequency and percentage distribution of responds to object



Inference:

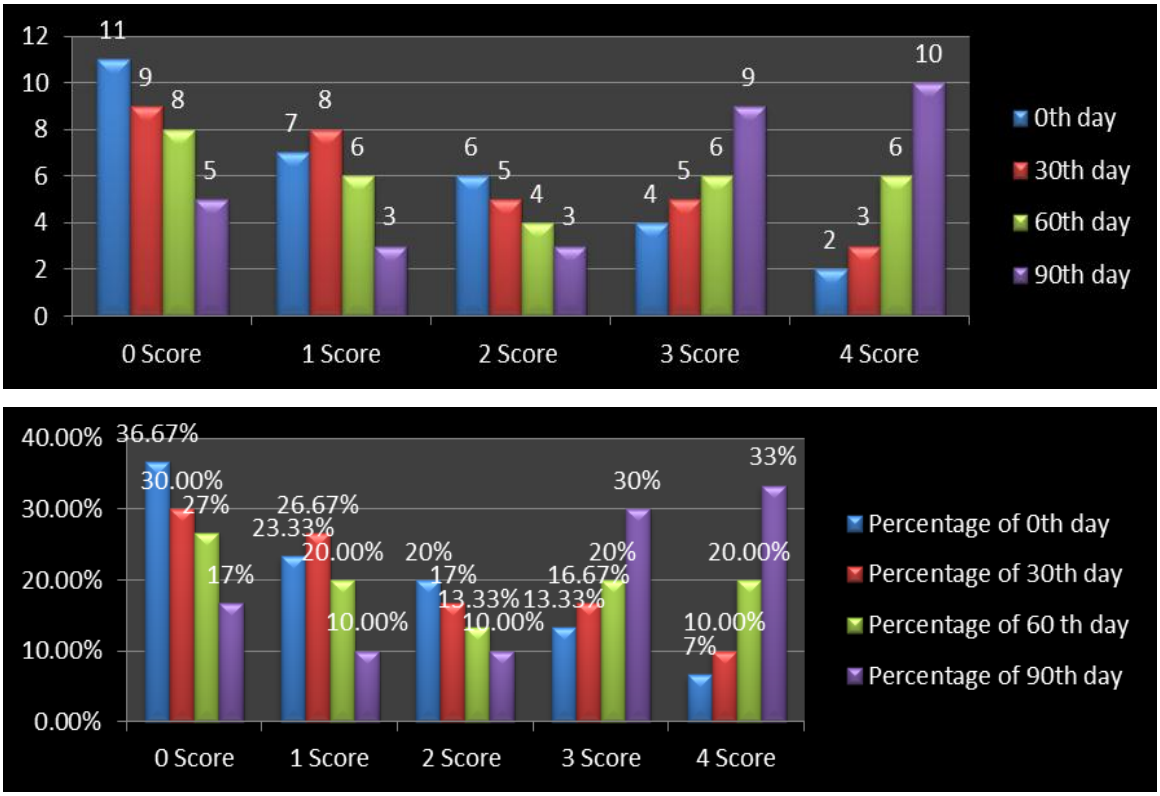
From the above table 46.67% of children had score-0 on 0th day and 13% of children had on 90th day. 16.67% of children had Score-1 on 0th day and 6.67% of children had on 90th day. 20% of children had Score-2 on 0th day and 10% of children had on 90th day. 10% of children had score-3 on 0th day and 33% of children had on 90th day. 7% of children had score-4 on 0th Day and 37% of children had on 90th day.

SENSORY ASPECTS

Table 5.5.15.25.Frequency and percentage distribution of Tracking objects

TRACKING OBJECTS								
Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	11	36.67%	9	30.00%	8	27%	5	17%
1	7	23.33%	8	26.67%	6	20.00%	3	10.00%
2	6	20%	5	17%	4	13.33%	3	10.00%
3	4	13.33%	5	16.67%	6	20%	9	30%
4	2	7%	3	10.00%	6	20.00%	10	33%

Fig 5.5.15.25.Frequency and percentage distribution of Tracking objects



Inference:

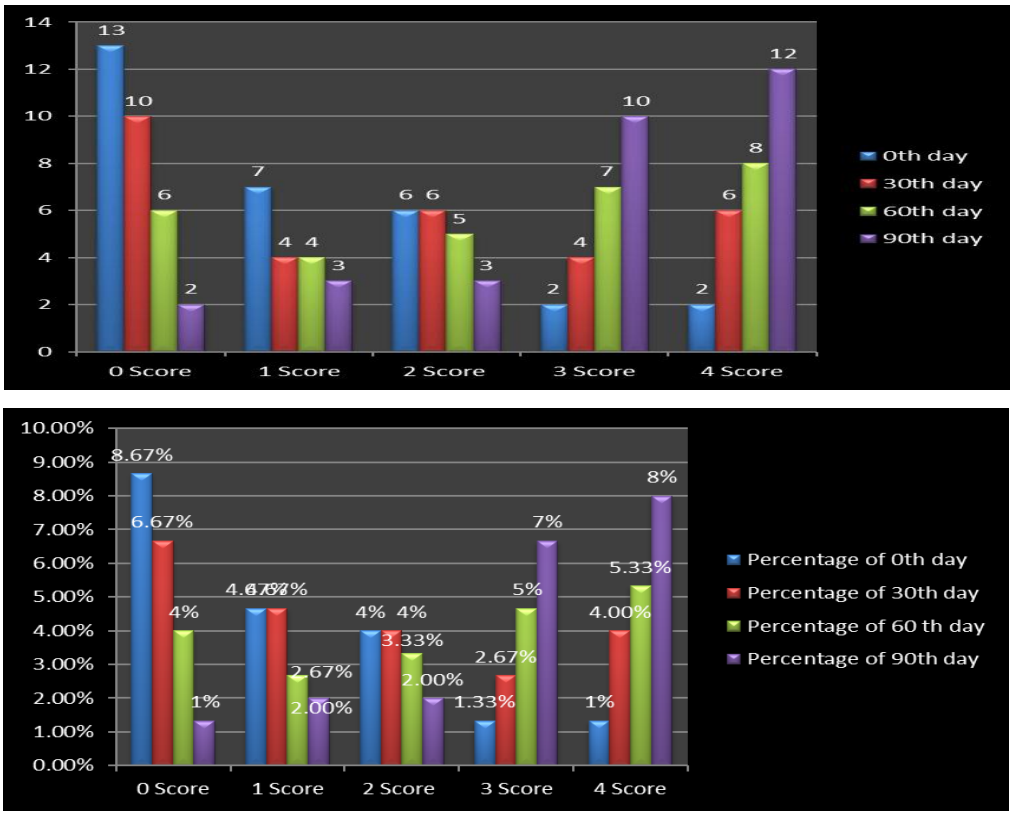
From the above table 36.67% of children had score-0 on 0th day and 17% of children had on 90th day. 26.67% of children had Score-1 on 0th day and 10% of children had on 90th day. 20% of children had Score-2 on 0th day and 10% of children had on 90th day. 13.33% of children had score-3 on 0th day and 30% of children had on 90th day. 7% of children had score-4 on 0th Day and 33% of children had on 90th day.

5.5.16. ANALYSIS AND INTERPRETATION

Table.5.5.16.1. Frequency and Percentage of Social Relationship and Reciprocity:

Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	13	8.67%	10	6.67%	6	4%	2	1%
1	7	4.67%	4	4.67%	4	2.67%	3	2.00%
2	6	4%	6	4%	5	3.33%	3	2.00%
3	2	1.33%	4	2.67%	7	5%	10	7%
4	2	1%	6	4.00%	8	5.33%	12	8%

Fig 5.5.16.1 Frequency And Percentage Of Social Relationship And Reciprocity



Inference:

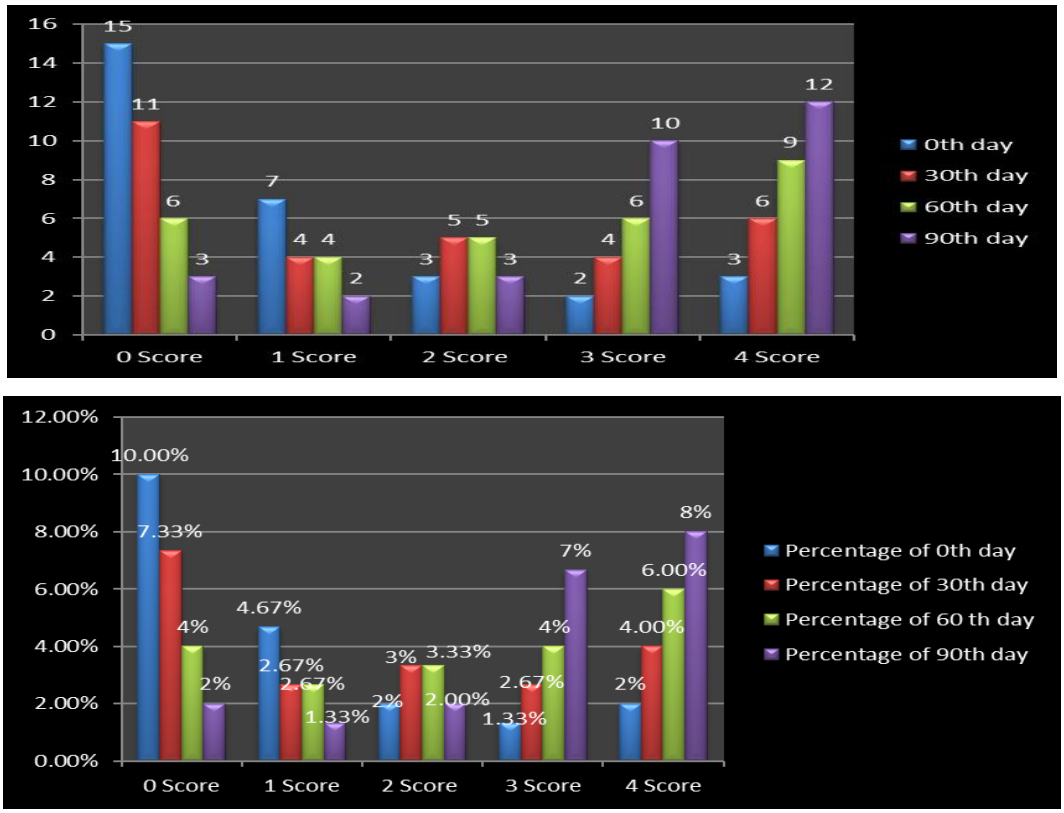
From the above table 8.67% of children had score-0 on 0th day and 1% of children had on 90th day. 4.67% of children had Score-1 on 0th day and 2% of children had on 90th day. 4% of children had Score-2 on 0th day and 2% of children had on 90th day. 13.33% of children had score-3 on 0th day and 7% of children had on 90th day. 1% of children had score-4 on 0th Day and 8% of children had on 90th day.

ANALYSIS AND INTERPRETATION

Table5.5.16.2 Frequency and percentage of Emotional Responsiveness

Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	15	10.00%	11	7.33%	6	4%	3	2%
1	7	4.67%	4	2.67%	4	2.67%	2	1.33%
2	3	2%	5	3%	5	3.33%	3	2.00%
3	2	1.33%	4	2.67%	6	4%	10	7%
4	3	2%	6	4.00%	9	6.00%	12	8%

Fig5.5. 16.2 Frequency And Percentage Of Emotional Responsiveness



Inference:

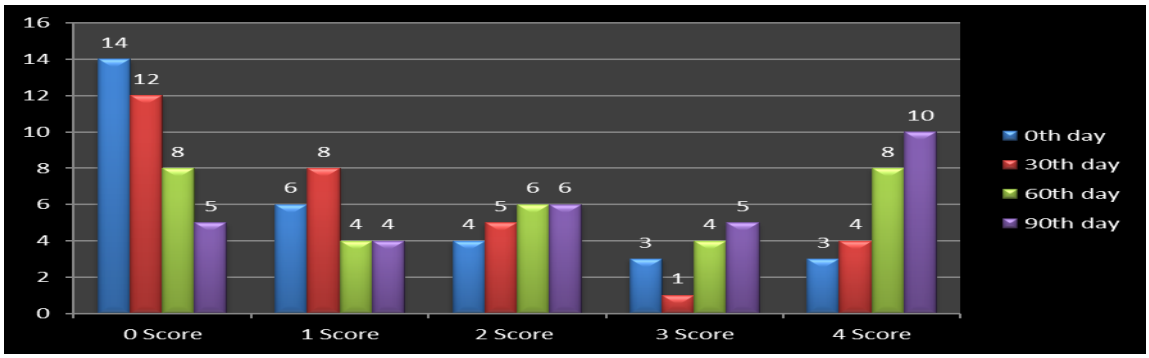
From the above table 10%% of children had score-0 on 0th day and 2% of children had on 90th day. 4.67% of children had Score-1 on 0th day and 1.33% of children had on 90th day. 2% of children had Score-2 on 0th day and 2% of children had on 90th day. 1.33% of children had score-3 on 0th day and 7% of children had on 90th day. 2% of children had score-4 on 0th Day and 8% of children had on 90th day.

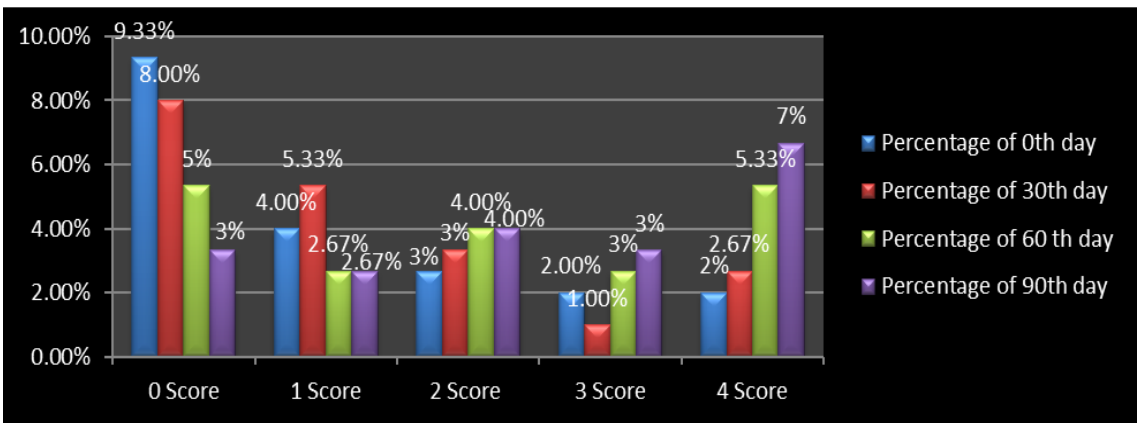
ANALYSIS AND INTERPRETATION

Table 5.5.16.3.Frequency and percentage of Speech Language and Communiaction Skills

Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	14	9.33%	12	8.00%	8	5%	5	3%
1	6	4.00%	8	5.33%	4	2.67%	4	2.67%
2	4	3%	5	3%	6	4.00%	6	4.00%
3	3	2.00%	1	1.00%	4	3%	5	3%
4	3	2%	4	2.67%	8	5.33%	10	7%

Fig 5.5.16.3 Frequency And Percentage Of Speech Language And Communiaction Skills





Inference:

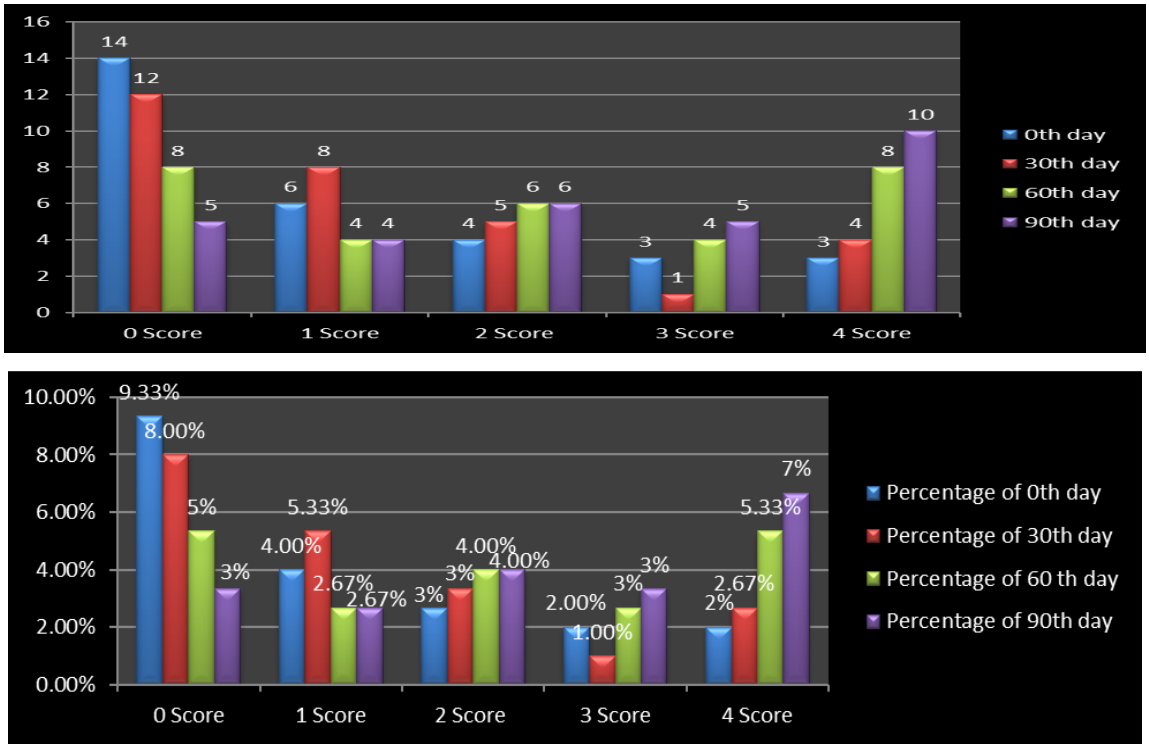
From the above table 9.33% of children had score-0 on 0th day and 3% of children had on 90th day. 4% of children had Score-1 on 0th day and 2.67% of children had on 90th day. 3% of children had Score-2 on 0th day and 4% of children had on 90th day. 2% of children had score-3 on 0th day and 3% of children had on 90th day. 2% of children had score-4 on 0th Day and 3% of children had on 90th day.

ANALYSIS AND INTERPRETATION

Table 5.5.16.4 Frequency and percentage of Behavioural patterns

Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	13	8.67%	10	6.67%	6	4%	2	1%
1	7	4.67%	4	4.67%	4	2.67%	3	2.00%
2	6	4%	6	4%	5	3.33%	3	2.00%
3	2	1.33%	4	2.67%	7	5%	10	7%
4	2	1%	6	4.00%	8	5.33%	12	8%

Fig 5.5.16.4 Frequency And Percentage Of Behavioural patterns



Inference:

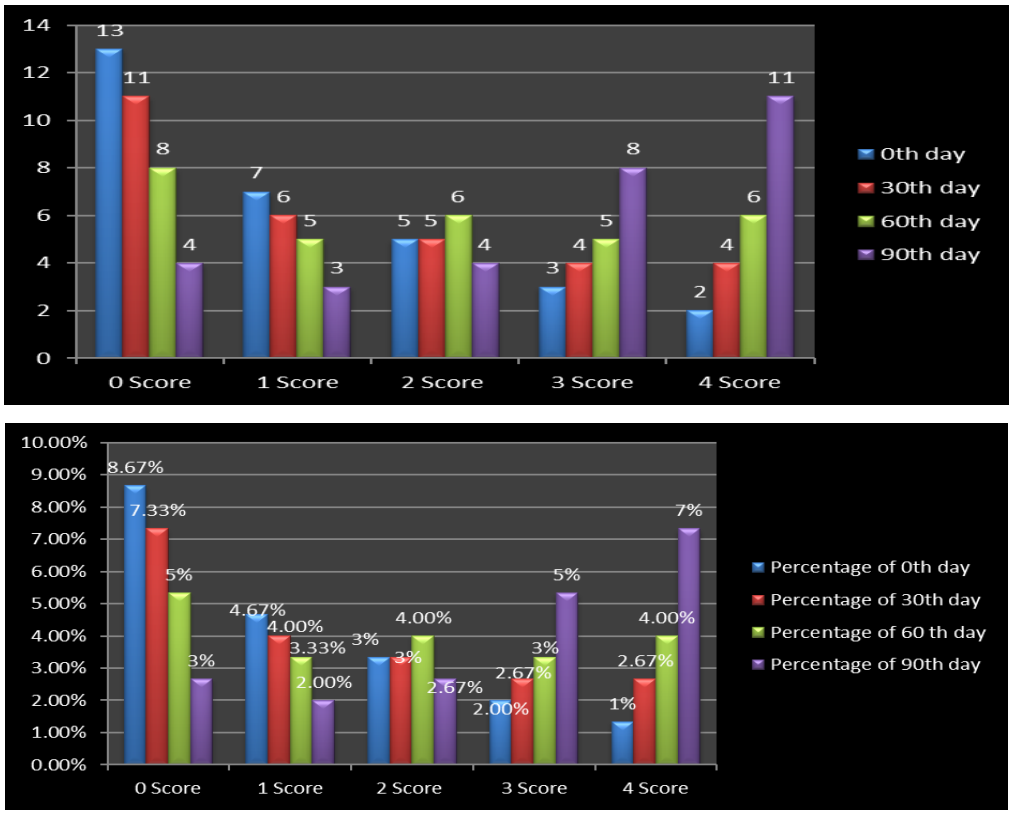
From the above table 8.67% of children had score-0 on 0th day and 1% of children had on 90th day. 4.67% of children had Score-1 on 0th day and 2% of children had on 90th day. 4% of children had Score-2 on 0th day and 2% of children had on 90th day. 1.33% of children had score-3 on 0th day and 7% of children had on 90th day. 1% of children had score-4 on 0th Day and 8% of children had on 90th day.

ANALYSIS AND INTERPRETATION

Table 5.5.16.5. Frequency and Percentage of Sensory aspects

Score	0th day		30th day		60th day		90th day	
	N	%	N	%	N	%	N	%
0	13	8.67%	11	7.33%	8	5%	4	3%
1	7	4.67%	6	4.00%	5	3.33%	3	2.00%
2	5	3%	5	3%	6	4.00%	4	2.67%
3	3	2.00%	4	2.67%	5	3%	8	5%
4	2	1%	4	2.67%	6	4.00%	11	7%

Fig 16.5 Frequency And Percentage Of Sensory aspects



Inference:

From the above table 8.67% of children had score-0 on 0th day and 3% of children had on 90th day. 4.67% of children had Score-1 on 0th day and 2% of children had on 90th day. 4% of children had Score-2 on 0th day and 2.67% of children had on 90th day. 2% of children had score-3 on 0th day and 5% of children had on 90th day. 1% of children had score-4 on 0th Day and 7% of children had on 90th day

5.5.17. STATISTICAL ANALYSIS

All collected data were entered into MS Excel software using different columns variable and rows as patients. STATA software was used to perform statically analysis .Basic descriptive statistics included frequency distribution and cross tabulation were performed. Bar diagram, Pie charts were used to describe the value of different variables for pictorial representation. The quantity variables were expressed as Mean and Standard deviation and qualitative data as percentage. A probability value of less than 0.05 was considered to indicate as statistical significance. Paired' test was performed for determining the significance between before and after treatment.

Table 5.5.17.1.Summary values of Clinical assessment parameters for Autism spectrum disorder in Children

Treatment	No. of Patients	Mean	Std Dev	Min	Max
0 score (Before)	30	248.33	102.53	125	600
0 Score (After)	30	503.33	125.55	250	625
4 Score (Before)	30	49.66	20.50	25	120
4 Score (After)	30	100.66	25.11	50	125
Social skills (Before)	30	49.83	21.06	25	120
Social Skills (After)	30	102.83	25.85	50	150
Emotional skills (Before)	30	47.16	22.19	25	120
Emotional skills (After)	30	98.66	26.12	50	125
Communication Skills (Before)	30	50.66	20.16	25	120
Communication Skills (After)	30	98	25.37	50	125
Behaviour Skills (Before)	30	52.66	22.88	25	120
Behaviour Skills (After)	30	104.5	27.92	50	125
Sensory Skills (Before)	30	46.83	19.54	25	120
Sensory skills (After)	30	99.66	25.01	50	125

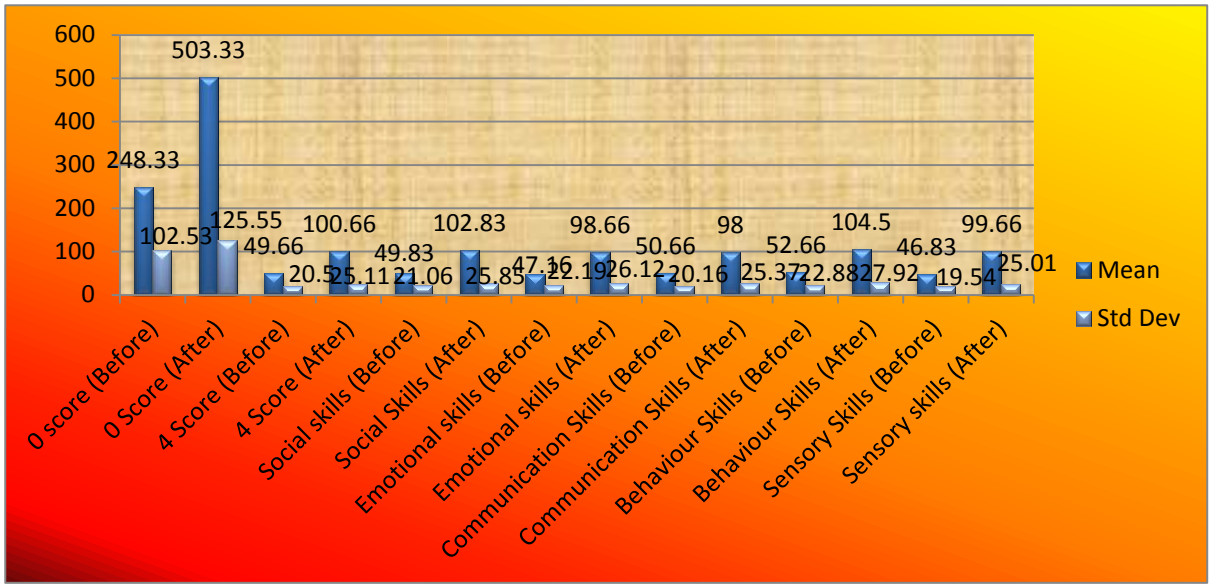


Fig: 5.5.17.1.Summary values of Clinical assessment parameters for ASD

Table 5.5.17.2. Statistical significance of treatment on ASD

Treatment	**t value**	**P value**
0 score (Before & After)	11.46	>1.0000
4 Score (Before & After)	11.46	>1.0000
Social skills (Before & After)	10.53	>1.0000
Emotional skills (Before & After)	11.00	>1.0000
Communication Skills (Before & After)	10.36	>1.0000
Behaviour Skills (Before & After)	10.75	>1.0000
Sensory Skills (Before & After)	11.73	>1.0000

The mean and standard deviation of clinical assessment parameters ,before and after treatment of 0 score ,4 Score ,Social skills ,Emotional skills ,Communication Skills , Behaviour Skills,Sensory Skills were 283.33±102.53, 503.33±125.55, 49.66±20.50, 100.66±25.11, 49.83±21.06, 102.83±25.85, 47.16±22.19, 98.66±26.12, 50.66±20.16, 98±25.37, 52.66±22.88, 104.5±27.92, 46.83±19.54, 99.66±25.01 respectively which is statistically highly significant (**Score 0**:t- value - 11.46, P>1.0000, **Score 4**: t- value – 11.46,

P>1.0000,**Social skills:** t- value – 10.53, P>1.0000, **Emotional skills:** t- value – 11.00, P>1.0000,**Communication skills:** t- value – 10.36, P>1.0000, **Behavioural Skills:** t- value – 10.75, P>1.0000 , **Sensory skills:** t- value – 11.73, P>1.0000).

There is significant difference between before and after treatment on clinical assessment parameter score i.e 86% improvement in this score after treatment

6. DISSCUSSION

Autism spectrum disorder is extremely controversial. There are 4 main categories of controversies may run into in discussion of ASD. There are Cause, Cure, Treatment, and Research.

Causes:

Most of them heard of the vaccines controversy surrounding Autism which has been thoroughly refused by science. Many scientists say that genes play a role in Autism. It is the subject of much debate. When environmental factor plays arolein causes is also hotly debated. Many theories heard and spectrum about everything from Autism beingncaused to be Vaccines, Gluten, cellphone, Some types of sugar, traumatic births and childhood illness.

Cure:

Still more controversial conversation of the cure. It may wish for a cure for ASDwant acceptance for individuals with Autism until such point that a cure is feasible. It is life long condition and there is no known but support can improve the quality of life.

Treatment:

Another controversy forASD includes treatments which are based in the behaviourism. Therefore someone who believes given certain types of Sugar contributes to Autism might put their child in diet free of food as treatment. This move would naturally be controversial among there who believes solely genetics

Research:

It is a multifaceted issue. Much research about ASD delves into the cause, cure, and treatment of ASD. Towards the later point, the applications of ASD in research, many people with Autism fear that research had a course of autism, culminating in prenatal screening of ASD, may lead to selective abortions of features who fall on the Autism spectrum disorder.

It may cover some of what science has to tell us about the cause, cure, treatment, research but for now know that is very controversial

In the present study, 30 Mantha sanni (ASD) cases were treated in the Kuzhandhai maruthuvam out patient department of Ayothidoss Pandithar Hospital, National Institute of siddha. The diagnosis was confirmed according to clinical features mentioned in textbook of Balavagadam and managed with the trial drug “Kurever Kudineer” (Internal), Sambrani thuvalai and Mysatchi Pugai (External) and the result was clearly observed.

This study proves the efficacy of "Kurever Kudineer" (Internal), Sambrani thuvalai and Mysatchi Pugai (External) in relieving the symptoms of Mantha sanni and the output of this study is discussed as follows

In **biochemical analysis**, the trial medicine Mantha sanni showed the presence of Starch, Tanin, Alkaloid and ferrous iron. Ferrous iron is more soluble and therefore more readily absorbed

In **Physicochemical analysis** was done as a preliminary evalution of the trial drug Kuruver kudineer. Loss on drying (LOD) is a method of measuring the amount of water and volatile matters in a sample when the sample is dried. Low moisture content is always desirable for higher stability of drugs. In Kuruver kudineer, the loss on drying at $105^{o}C$ was found to be 5.54%. So the determination of moisture content shows the good stability of the drug Kuruver kudineer

The total Ash values are helpful in determining the quality and purity of drugs, especially in powder form. The total Ash value found to be 6.82%. The minimal level of total ash shows the less inorganic residue and purity of the trail drug. So There is no negative results found in Kuruver kudineer.

Phytochemical analysis was done as a preliminary evalution of the trial drug Kuruver kudineer .The report shows positive in Mayers test for alkaloida, Molish test and benedict test for carbohydrates, Froth test for saponin,Alkaline reagent test and lead acetate test for flavonoids, Naoh test for quinones.

In **Anxiolytic activity** (Elevated plus maze method) shows low dose and high dose of kuruver kudineer action were good when compared to control and standard group (I.p. Alprazolam). The results were satisfactorily good.

In **Social relationship and Reciprocity skills** - Challenges with social interactions, social behavior, and social understanding remain the defining characteristics of Autism Spectrum Disorder (ASD). Although young children with autism sometimes seem to prefer to be by themselves, one of the most important issues, especially for older children and adults, is the development of friendships with peers. It can take a great deal of time and effort for people with ASD to develop the social skills needed to interact successfully with others, so it is important to start developing social ability early. Furthermore, bullying in middle and high school, not to mention at the workplace for some adults, can be a major problem for people with autism, and the development of friendships is one of the best ways to prevent it. In this research, effective Social relationship score were analysed in children who were enrolled in this study.

The clinical parameters such as eye contact, social smile, solitary and repetitive activities, social interaction, peer relationship were analysed. The average percentage showed there was stadrared decline of behavirol pattern from 0^{th} day to 90^{th} day. If the children entrolled with severe pattern changes at the end of the treatment period syptoms significantly reduced.

In **Emotional responsiveness Skills** more generic emotional impairments exist in people with ASD that cause facial emotion processing deficits, would expect to observe emotional impairments in language as well. This article is to provide a systematic review of the empirical literature with respect to emotional language in ASD, discuss the implications for our understanding of ASD. In this research, effective emotional responsiveness score were analysed in children who were enrolled in this study.

The clinical parameter such as such as inappropriate emotional response, exaggerated emotions, Self-stimulating emotions, fear for danger, Excited for no apparent reasons were analysed.The average percentage showed there was stadrared decline of behavirol pattern from 0th day to 90th day. If the children entrolled with severe pattern changes at the end of the treatment period syptoms significantly reduced.

In **Speech, language and communication skills** Children with ASD are often unable to use gestures such as pointing to an object to give meaning to their speech. They often avoid eye contact, which can make them seem rude, uninterested, or inattentive. Without meaningful gestures or other nonverbal skills to enhance their oral language skills, many children with ASD become frustrated in their attempts to make their feelings, thoughts, and needs known. They may act out their frustrations through vocal outbursts or other inappropriate behaviors. In this research, effective communication skills score were analysed in children who were enrolled in this study.

The clinical parameters such as Non-verbal language to communicate the others, Stereotyped and repetitive use of language, unusual noises, meaningless words, understand the meaning of communication were analysed. The average percentage showed there was stadrared decline of behavirol pattern from 0th day to 90th day. If the children entrolled with severe pattern changes at the end of the treatment period syptoms significantly reduced.

In **Behavirol pattern**, the core features of autism are areas in which difficulties can lead to feelings of frustration, confusion, anxiety or lack of control, resulting in behavioral responses. Since behavior is often a form of communication, many individuals with autism voice their wants, needs or concerns through behaviors, rather than words. This does not

mean that they are always knowingly communicating. In this research, effective behavioural patterns score were analysed in children who were enrolled in this study.

The clinical parameters such as Hyperactivity and restlessness, Aggressive behaviour, attachment to inanimate objects, Self-injurious behaviour, and temper tantrums were analysed. The average percentage showed there was stadrared decline of behavirol pattern from 0^{th} day to 90^{th} day. If the children entrolled with severe pattern changes at the end of the treatment period syptoms significantly reduced.

In **Sensory aspects**, Children and adults with autism, as well as those with other developmental disabilities, may have a dysfunctional sensory system. Sometimes one or more senses are either over- or under-reactive to stimulation. Such sensory problems may be the underlying reason for such behaviors as rocking, spinning, and hand-flapping. Although the receptors for the senses are located in the peripheral nervous system (which includes everything but the brain and spinal cord), it is believed that the problem stems from neurological dysfunction in the central nervous system--the brain. In this research, effective sensory aspects score were analysed in children who were enrolled in this study.

The clinical parameters such as Unusual visions,Stares into space for long periods of time, Insensitive to pain, Responds to object , Difficulty in tracking objects were analysed . The average percentage showed there was stadrared decline of behavirol pattern from 0^{th} day to 90^{th} day. If the children entrolled with severe pattern changes at the end of the treatment period syptoms significantly reduced.

The trial medicine chosen for treatment of Mantha sanni was "Kuruver kudineer". The ingredients of this drug have the property of managing Mantha sanni.

Vettiver: Antioxidant, Anxiolytic, CNS depressant

Vilamichu: Antioxidant, CNS depressant

Chukku: Anti axidant, Anti inflammatory, Slective serratonin reuptake inhibitors and antilipidemic activity

Parpadagam: Antioxidant, Antideprassant and hepatoprotective activity

Siruthekku: Antioxidant, Anti depressant and Anti carcinogenic activity

Distribution according to clinical presentation

Out of 30 patients of this clinical trial, all cases under 3-12 years of age group, Impaired social interaction, poor eye to eye contact, aggressiveness and blabble sound. The clinical improvement was accurately noted and further follow up was made through assessment form.

Onset of disease

The mode of the mantha sanni was early onset and fount at the age of after one and half years.

Age

Among 30 cases , 60% of the cases belongs to the age group 3-6 years,30 % of the cases belongs to the age group 7-9 years and 10 % of the cases belongs to the age group 10-12 years. Though 60% of the cases were 3-6 years of Age group so there is no related difference in sex distribution and this disease can affect either age.

Sex

Out of 30 patients, 63% patients were male children and 37% patients were female children. Though 63 % patient were more in male children so there is no related difference in sex distribution and this disease can affect either sex.

Food habits

Out of 30 patients, 86.7% patients were mixed diet and 13.3% patients were vegetarians. Though 86.7% Patient were mixed diet so there is no related in vegetarian and mixed diet and this disease can affect any food habits.

Immunisation

Out of 30 patients, 90%patients were proper immunisation, 6.70% patients were incomplete immunisation, and 3.30% 1 patient were Complete and time lag. Though 90% Patient were proper immunaisation, so there is no related in immunisation and this disease can affect any food habits.

Thinaikal

Out of 30 patients, 6.7%patients were in Kurinji thinai, 93.30% patients were Neithal thinai, There is no related in thinaikaland disease

Uyirthathukkal

Uyirthathukkal include 3 vital humours namely vatham, pitham, kabam. The derangement in any of the above three causes disease. This was noticed in the 30 cases and are discussed below.

Vali (Vatham)

Out of 30 patients,

1. Pranan was affected in 66.7% cases due to sleep distubances
2. Abanan was affected in 6.7% cases because of Constipation
3. Samanan was affected in 100% cases due to derangement of other vatha’s.

4. Nagan was affected in 20% cases due to Social intraction
5. Koorman was affectedin 46.7% due to lack of eye conatct

Azhal (pitham)

Out of 30 patients,

1. Anaalagam was affected in 66.7% cases due to indigestion
2. Ranjagam was affected in6.7% cases due to anemic children
3. **Alosagam was affected in 2.8% cases because of impaired communication.**

Iyyam (Kabam)

Out of 30 patients,

1. Avalambagam was affected in all cases 100% due to derangement of other Iyya's.
2. Tharpagam was affected in 46.7% cases due to poor eye to eye contact

Ezhu udarkattugal

Out of 30 patients,

1. Saaram was affected in 13.4% due to poor appetite.
2. Senneer was affected in 6.7 % because of pallor of the eyes.
3. Envagai thervugal
4. Naadi has been observed in 100% of cases had Kabavatha naadi.
5. Naa was affected in 10% of cases due to anemia
6. Mozhi was affected in 66.7% cases as they had impaired communication skills
7. Vizhi was affected in 46% cases due to poor eye to contact.
8. **Malam was affected in 6.7% of the cases and they had contipation**

Neikuri

According to Neikuri

1. Vatham neer was observed in 10% of cases.
2. Pitham neer was observed in 6.7% of cases.
3. Kabam neer was observed in 83.3% of cases.

Majority of the cases (83.3%) proves that the disease was due to derangement of kabam.

Clinical manifestation

Among the 30 cases , Among the 30 cases , 100% of the cases had Mantha sanni (ASD) and 19.3%of the cases had Social impairment ,20.3% of the cases had emotional changes, 19.9%of the cases had impaired communication skalls, 19.3% of the cases had behavioural problems, 19.6% of the cases had sensory aspects.

Statistical Analysis:

There is significant difference between before and after treatment on clinical assessment parameter score i.e 86% improvement in this score after treatment

So it is safe to be administrated in children. There is no adverse effect produced by the trial drug Kuruver kudineer during the entire course of treatment. The result of this study reveals that the trial drug Kuruver kudineer is having a significant effect in the treatment of patients with Mantha sanni. Thus clinically there was satisfactory improvement in all the cases and no adverse effects were noted. At the end of the treatment all the patients were advised to contact the outpatient department of kuzhandhai maruthuvam for further follow up.

Advice –Dietary and Habitual

The patients were advised

1. To avoid Gluten foods
2. To avoid casein foods
3. To avoid contaminated food and water.
4. To drink jeera water and almond shake
5. Increase intake of vitamins and minerals

7. SUMMARY

A child who has been determined to require special attention is called as Special children. Children with multiple disabilities assossiated with impairment in social, cognitive skills, communication skills, behavioural changes and sensory issues called Autism spectrum disorder. Many Allopatyhic medications like respiridon, valporic acid are widely used for ASD. Not all the patients benefit from this treatment. However this drug has to shown undesirable side effects.

It is in the text that we have undertaken a review of the Siddha formulation which could help management of ASD.In the view of the abovde, great efforts have been made to find out the Siddha medicine and methologies to improve the life styles of ASD children.

The available literature on Manthasanni reveals that this is a disease of Autism spectrum disorder. For the purpose of study about Mantha sanni, 30 patients of both sexes were selected between the age group of 3-12 years. The study revealed that the incidence of the disease is greater in the age group of 3-6 years.

The study revealed that.43%of the cases belonged to high socio economic status. Regarding unknown aetiology 100% of the cases developed diseases after the age of one and half years. In Uyir thathukkal vatham, pitham, kabam were affected in 100% of cases. In Udal thathukkal Saram was affected in 2.6% cases. In Envagai thervugal, Neikuri indicated kabaneer (Pearl like shape) in all the cases.

Patients attending the kuzhandhai maruthuvam OPD of Ayothidoss Pandithar Hospital, NIS having the complaints of Mantha sanni is diagnosed and taken for this study. Clinical diagnosis of Mantha sanni is done on the basis of clinical feature described in Balavagadam text.

Autism is an umbrella term for Autism spectrum disorder which is charscterised by Constant problem with social communication and interactions across a variety of contexts

Early onset of symptoms (typically in the first two years of life).Repetitive, restricted patterns of behaviour, Activities and interests. Symptoms that cause major impairment in social, educational and other important area of functioning

It is called a spectrum because of the wide range of symptoms and impairment level in children can have. Some are only mildly affected by their symptoms, while the other children are severely disabled. Diagnosis has been made based on the specially prepared proforma, which includes all clinical signs and symptoms of the disease.A detailed history has been taken and recorded.

Clinical studies were carried out after obtaining proper permission from IEC of National Institute of Siddha via IEC number NIS/IEC/2016/11-19/ 14.10.2016 and the trial was registered in Clinical trial registry of India via CTRI number CTRI/2017/05/008698. The authentications of the new drugs are obtained from the Medicinal Botanist of NIS and the medicine is prepared in the Gunapadam laboratory of NIS under the guidance and superviser of the guide. Physicochemical and Biochemical analysis for the drug has been carried out.

In treatment aspect all the 30 cases were treated with Kuruver kudineer internally and Sambrani and mysatchi pugai (externally) for an average of 90days.The observation made during this study showed that the trial medicine was clinically effective.

After the treatment period of 3 months ,the Summary of case study were shown in all the 30 ASD children are improved cognitive functions, eye to eye contact and reduced hyperactivity behaviour. There was sitting tolerance, enhanced the mind calming activity. Able to mingle the other children and try to speak the verbal with limited skills and having good sound sleep. So the Siddha internal and external therapies are enhancing the ‘quality of life’ of ASD childrenThe potency of drug was studied by pharmacological, phytochemical, physicochemical and biochemical analysis. It showed that the drug has good action. The drug also has Anxiolytic activity. All the patients showed very good response. No patients developed any adverse effects. The action of trial drug and progress in the patients was encouraging

8. CONCLUSION

In this study, results were found to be improvement in all the cases.No adverse effects were noticed during the treatment.Further follow up of these patients showed good recovery and fine improvement.The preparation of the medicine is simple as well as economical.The trial drug has anxyiolytic actions. So it is concluded that for the disease Mantha sanni, the treatment with Kuruver kudineer is good, in the view of efficacy and safety.

The Global burden of Mantha sanni (Autism spectrum disorder), increasing prevalence and its impact in reducing the quality of life in children has prompted the author to choose an efficient and nutritive drug which is believed to good in central nervous system. The treatment of Mantha sanni with Kuruver Kudineer has showed good response with no adverse effect, very effective and simple to administer.

This has, in turn, provided a golden opportunity for new drug established in themanagement of Mantha sanni.

Our perception of autism has evolved over time. Sixty years ago autism was nothing more than an unrecognized developmental delay generally lumped in with mental retardation. Today it is recognized as an independent neurologically based disorder of significance, a major public health problem, and a topic of much research. So we will overcome this disease by regular practice of Siddha treatment and also with help of Role of Families, Educational services, Effective Interventions, Public Policies, Personal preparation.

Further study is recommended for scientific validation to prove its clinical efficacyin multicenter clinical study.

9. RECOMMENDATIONS

As with research work presented in this thesis has answered many questions of Siddha medicine and methodologies in clinical parameters however, in doing so it has created even more questions and areas for further research. Further research not only must the outcome measures to be valid and reliable, but they must be relavant to the child and family concerened.

1. Further studies of the efficacy of the combined use of kuruver kudineer as Internal, sambrani thuvalai and mysatchi pugai as External in the management of children with ASD should use a randomized controlled study design in multicentre which is the gold standard for clinical research.

2. We are strongly recommended need for further research as there are not reported studies are available on effect of Siddha medicines which focuses on Speech and language, Cognition, Social relationship, behavioural patterns and Sensory aspects in Children with ASD. This research has shown the value of providing siddha medicines with these children and they have developed somescope for further research in above aspects.

3. Need to scrutinize and produce the siddha philosophical guidelines towards the management of children with ASD which consists of complete full information and management of these children with traditional approach for physicians and parents

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10. Appendix

Appendix- I	-	Screenig form
Appendix- II	-	Consent form
Appendix – III	-	Case report form
Appendix- IV	-	Patient information sheet
Appendix- V	-	Drug compliance foorm
Appendix- VI	-	Withdrawl form
Appendix- VII	-	Adverse reaction
Appendix- VII	-	Pharmacovigilance form
Appendix- VIII	-	Dietry form

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POST GRADUATE DEPARTMENT OF KUZHANDHAI MARUTHUVAM

Clinical Evaluation of Kuruver Kudineer (Internal Medicine) , Sambrani Thuvalai And Mysatchi Pugai (External Medicine) For Mantha Sanni In Children.

FORM I – SCREENING FORM

Principle Investigator: Dr.G.Dharshini priya

Clinical trial registry no: CTRI/2017/05/008698 Serial.No:

DATE	OP.NO / IP.NO	NAME	AGE / SEX	DATE OF ENROLLMENT	INFORMANT	RELIABLITY

INCLUSION CRETERIA:

	YES	NO
Children of age group under 3- 12 years	☐	☐
Impaired social interaction	☐	☐
Mild to Moderate aggressiveness	☐	☐
Repetitive behaviour	☐	☐
Lack of eye contact	☐	☐
Blabble sound	☐	☐
Clinically diagnosed as a ASD	☐	☐

Child will be include 4 or more criteria for this clinical trial study

EXCLUSION CRITERIA:

	YES	NO
Epilepsy	☐	☐
Severe aggressiveness	☐	☐
Cerebral palsy	☐	☐
Congenital heart disease	☐	☐

ADMITTED TO TRIAL: YES ☐ NO ☐

IF YES, SERIAL NO:

OP NO / IP NO:

Signature of the Investigator:

Date:

Signature of the Guide:

Station:

Signature of the HOD:

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FORM II – CONSENT FORM

CERTIFICATE BY INVESTIGATOR

I certify that I have disclosed all the details about the study in the terms readily understood by the parent/guardian

Signature _____

Date _____

Name _____

CONSENT BY PARENT

I have been informed to my satisfaction, by the attending physician, the purpose of the clinical trial, and the nature of drug treatment and follow-up including the laboratory investigations to be performed to monitor and safeguard my son/daughter body functions.

I am aware of my right to OPD my son/daughter out of the trail at any time during the course of the trail without having to give the reasons for doing so.

I, exercising my free power of choice, hereby give my consent to include my son/daughter as a subject in the clinical trial of "clinical evaluation of Kuruver kudineer (internal medicine), Sambrani thuvalai and Mysatchi pugai (external medicine)

Date:

Signature _____

Name _____

Signature of witness _____

Name _____

தேசிய சித்தமருத்துவ நிறுவனம்

அயோத்திதாச பண்டிதர் மருத்துவ நிறுவனம்

குழந்தை மருத்துவத்துறை

பரிகரிப்புத் திறனைக் கண்டறியும் மருத்துவ ஆய்வு

ஒப்புதல் படிவம் - II

ஆய்வாளரால் சான்றளிக்கப்பட்டது

நான் இந்த மருத்துவ ஆய்வைகுறித்த அனைத்து விபரங்களையும் குழந்தையின் பெற்றோருக்கு புரியும் வகையில் எடுத்துரைத்தேன் என உறுதி அளிக்கிறேன்

தேதி : கையொப்பம்:

இடம் : பெயர் :

நோயாளியின் பெற்றோர் ஒப்புதல் படிவம்

என்னிடம் இந்த மருத்துவ ஆய்வின் காரணத்தையும், மருந்தின் தன்மை மற்றும் மருத்துவ வழிமுறைப் பற்றியும், இந்த மருத்துவத்தை தொடர்ந்து எனது குழந்தையின் உடல், இயக்கத்தைக் கண்காணிக்கவும், அதனை பாதுகாக்க பயன்படும் மருத்துவ ஆய்வுக்கூடப் பரிசோதனைகள் பற்றியும் திருப்தி அளிக்கும் ஆய்வு மருத்துவரால் விளக்கிக் கூறப்பட்டது.

நூான் இந்த மருத்துவ ஆய்வின் போது காரணம் எதுவும் கூறாமல் எப்போது வேண்டுமானாலும் என் குழந்தையை விடுவித்துக் கொள்ளும் உரிமையை தெரிந்திருக்கிறேன்.

நான் என்னுடைய சுதந்திரமாக தேர்வு செய்யும் உரிமையைக் கொண்டு மந்த சந்நி நோய்க்கான குருவேர் குடிநீர் (உள் மருந்து) மற்றும் சாம்பிராணி துவாலை, மைசாட்சி புகை (வெளிமருந்து) பரிகரிப்பு திறனைக் கண்டறியும் மருத்துவ ஆய்வுக்கு எனது குழந்தையை உட்படுத்த ஒப்புதல் அளிக்கிறேன்.

தேதி: பெற்றோர் பெயர் :

இடம்: கையொப்பம் :

சாட்சிக்காரர் பெயர் :

கையொப்பம் :

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FORM III - CASE REPORT FORM

Principle Investigator: Dr.G.Dharshini priya

Clinical trial registry no: CTRI/2017/05/008698 Serial.No:

DATE	OP.NO / IP.NO	NAME	DATE OF BIRTH	AGE /SEX

FATHER/ MOTHER/ GAURDIAN NAME	OCCUPATION AND INCOME	RELIGION	POSTAL ADDRESS AND CONTACT NO.	RELAIBILITY

Present Complaints and Duration :

H/O of Past Illness :

Medical History :

Any Medical history YES ☐ No ☐

If Yes, Details

Immunisation History :

Immunisation Complete ☐ Incomplete ☐ Complete but time Lag ☐

Familial History :

Any relevant Hereditary /Family History Yes ☐ No ☐

If Yes, Details

Food Habits :

Vegetarian ☐ Non vegetarian ☐ Mixed ☐

Body Measurements :

PARAMETERS	UNIT	EXPECTED HEIGHT AND WEIGHT CALCULATED BY WEECH'S FORMULA
Height in cm		
Weight in Kg		

Habits :

1. Picca Yes ☐ No ☐
2. Nail biting Yes ☐ No ☐
3. Bowel movements Yes ☐ No ☐
4. Thumb sucking Yes ☐ No ☐
5. Enuresis Yes ☐ No ☐

Vital signs :

1. Pulse rate -
2. Heart rate -
3. Respiratory Rate -
4. Temperature -

Examinations:

GENERAL EXAMINATION	NORMAL	ABNORMAL	IF ABNORMAL, PROVIDE BREIF DESCRIPTION AND RECORD, IF CLINICALLY SIGNIFICAL OR NOT
General Appearance	☐	☐	
Skin And Nails	☐	☐	
Eyes, Ears, Nose and Throat	☐	☐	
Head and Neck	☐	☐	
Pedal Oedema	☐	☐	
Lymphadenopathy	☐	☐	

SYSTEMIC EXAMINATION	NORMAL	ABNORMAL	IF ABNORMAL, PROVIDE BREIF DESCRIPTION AND RECORD, IF CLINICALLY SIGNIFICAL OR NOT
Respiratory System	☐	☐	
Cardiovascular System	☐	☐	
Gastro intestinal System	☐	☐	
Musculo skeletal System	☐	☐	
Central Nervous System	☐	☐	
Endocrine System	☐	☐	
If Others , Specify			

HIGHER INTELLECTUALL FUNCTIONS	NORMAL	ABNORMAL	IF ABNORMAL, PROVIDE BREIF DESCRIPTION AND RECORD, IF CLINICALLY SIGNIFICAL OR NOT
Consciousness	☐	☐	
Orientation	☐	☐	
Memory	☐	☐	
Language	☐	☐	
Sleep pattern	☐	☐	
Handedness	☐	☐	

Haematology :

Clinical Haematology Laboratory Test Performed? Yes ☐ No ☐

If not, Explain _____

Date of the Sample :

Time of the Sample :

HAEMATOLOGY	VALUE	UNIT	IF INDICATED AS OUT OF NORMAL RANGE ON REPORT, PLEASE STATE IF CLINICALLY SIGNIFICANT
WBC			YES ☐ NO ☐
RBC			YES ☐ NO ☐
Hb			YES ☐ NO ☐
HCT			YES ☐ NO ☐
MCV			YES ☐ NO ☐
MCH			YES ☐ NO ☐
PLT			YES ☐ NO ☐
NEUTROPHILS			YES ☐ NO ☐
LYMPHOCYTES			YES ☐ NO ☐
MONOCYTES			YES ☐ NO ☐
EOSINOPHILS			YES ☐ NO ☐
BASOPHILS			YES ☐ NO ☐
RETICULOCYTES			YES ☐ NO ☐
OTHER TEST			YES ☐ NO ☐

SIDDHA ASSESSMENT

பருவங்கள்	ஆண் குழந்தை		பெண் குழந்தை	
	இயல்பு	பாதிப்பு	இயல்பு	பாதிப்பு
1. காப்பு	☐	☐	☐	☐
2. செங்கீரை	☐	☐	☐	☐
3. தால்	☐	☐	☐	☐
4. சப்பாணி	☐	☐	☐	☐
5. முத்தம்	☐	☐	☐	☐
6. வாரானை	☐	☐	☐	☐
7. அம்புலி	☐	☐	☐	☐
8. சிறுபறை/ கழங்கு	☐	☐	☐	☐
9. சிற்றில்/ அம்மானை	☐	☐	☐	☐
10. சிறுதேர்/ ஊஞ்சல்	☐	☐	☐	☐

Nilam:-

Kurinji ☐ Mullai ☐ Marutham ☐ Neithal ☐ Paalai ☐

Kaala Iyalbu:-

Kaarkalam ☐ Koothirkaalam ☐ Munpanikaalam ☐

Pinpanikaalam ☐ Illavenirkaalam ☐ Muthuvenirkaalam ☐

Yaakai:-

Vatham ☐ Vatha Pitham ☐ Vatha Kabam ☐

Pitham ☐ Pitha vatham ☐ Pitha Kabam ☐

Kabam ☐ Kaba Vatham ☐ Kaba Pitham ☐

Gunam:-

Sathuvam ☐ Rasatham ☐ Thamasam ☐

Pori / Pulangal:-

	Normal	**Affected**	**Normal**	**Affected**	**Remarks**
Mei / unarvu	☐	☐	☐	☐	
Vaai / suvai	☐	☐	☐	☐	
Kan / parvai	☐	☐	☐	☐	
Mooku/ natram	☐	☐	☐	☐	
Sevi / olli	☐	☐	☐	☐	

Kanmendhirium / Kanmavidayam

	Normal	**Affected**	**Normal**	**Affected**	**Remarks**
Kai / dhanam	☐	☐	☐	☐	
Kaal / ghamanam	☐	☐	☐	☐	
Vaai / vaaku	☐	☐	☐	☐	
Eruvaai / visarkam	☐	☐	☐	☐	
Karuvaai /anantham	☐	☐	☐	☐	

UYIR THATHUKKAL:

Vatham:

	Normal	Affected	Remarks
Pranan	☐	☐	
Abanan	☐	☐	
Viyanan	☐	☐	
Uthanan	☐	☐	
Samanan	☐	☐	
Nagan	☐	☐	
Koorman	☐	☐	
Kirukaran	☐	☐	
Devathathan	☐	☐	
Dhanajeyan	☐	☐	

Pitham:

	Normal	Affected	Remarks
Analam	☐	☐	
Ranjagam	☐	☐	
Saathagam	☐	☐	
Alosagam	☐	☐	
Prasagam	☐	☐	

Kabam:

	Normal	Affected	Remarks
Avalambagam	☐	☐	
Kilethagam	☐	☐	
Pothagam	☐	☐	
Tharpagam	☐	☐	
Santhigam	☐	☐	

UDALTHATHUKKAL:

	Normal	Affected	Remarks
Saaram	☐	☐	
Senneer	☐	☐	
Oon	☐	☐	
Kozhuppu	☐	☐	
Enbu	☐	☐	
Moolai	☐	☐	
Sukilam / Suronitham	☐	☐	

ENVAGAI THERVUGAL:

	Normal	Affected	Remarks
Naa			
Niram	☐	☐	
Thanmai	☐	☐	
Suvai	☐	☐	
Niram	☐	☐	
Mozhi	☐	☐	
Vizhi	☐	☐	
Niram	☐	☐	
Thanmai	☐	☐	
Paarvai	☐	☐	
Sparisam	☐	☐	

Malam

Niram	Normal	☐	Affected	☐
Nurai	Normal	☐	Affected	☐
Elagal	Normal	☐	Affected	☐
Erugal	Normal	☐	Affected	☐

Moothiram

Neerkuri:	Niram	Normal ☐	Affected ☐
	Edai	Normal ☐	Affected ☐
	Nurai	Normal ☐	Affected ☐
	Manam	Normal ☐	Affected ☐
	Enjal	Normal ☐	Affected ☐

Neikuri:

Vatham ☐

Pitham ☐

Kabam ☐

Others _____

Naadi:

End of the Trail:

Date of trial completion/withdrawal:

Date last trial medication given:

- Clinical Assessment parameter (0^{th} day, 30^{th} day , 60^{th} day, 90^{th} day)

Date: **Signature of Investigator**

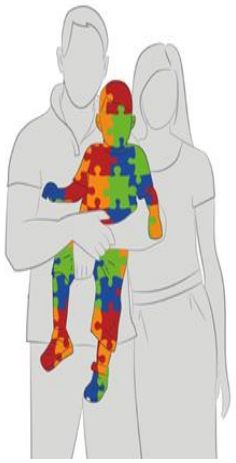
NATIONAL INSTITUTE OF SIDDHA

AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

POST GRADUATE DEPARTMENT OF KUZHANDHAI MARUTHUVAM

CLINICAL ASSESSMENT PARAMETERS FOR AUTISM SPECTRUM DISORDER IN CHILDREN

(0^{TH} DAY, 30^{TH} DAY, 60^{TH} DAY, 90^{TH} DAY)



Principle Investigator : Dr.G.Dharshini priya

Clinical trial registry no: CTRI/2017/05/008698 **Serial.No:**

DATE	OP.NO/ IP.NO	NAME	AGE/SEX	DATE OF ENROLLMENT AND DATE OF COMPLETION	INFORMANT	RELAIABILITY

S.NO	SCALE	SKILLS	(5) 0	(10) 1	(15) 2	(20) 3	(25) 4
1.	**SOCIAL RELATIONSHIP AND RECIPROCITY**	Eye contact					
		Social smile					
		Solitary and repetitive activities					
		Social interaction					
		Peer relationship					
2.	**EMOTIONAL RESPONSIVENESS**	Inappropriate Emotional response					
		Exaggerated emotions					
		Self-stimulating emotions					
		Fear for danger					
		Excited for no apparent reasons					

3.	**SPEECH, LANGUAGE AND COMMUNICATION SKILLS**	Non-verbal language to communicate the others					
		Stereotyped and repetitive use of language					
		Unusual noises					
		Meaningless words					
		Understand the real meaning of communication					
4.	**BEHAVIOURAL PATTERNS**	Hyperactivity and restlessness					
		Aggressive behaviour					
		Attachment to inanimate objects					
		Self-injurious behaviour					
		temper tantrums					
5.	**SENSORY ASPECTS**	Unusual visions					
		Stares into space for long periods of time					
		Insensitive to pain					
		Responds to object					
		Tracking objects					

Severe (125-249)	**Moderate to severe (250-374)**	**Mild to Moderate (375-499)**	**Mild (500-624)**	**Normal to Mild (≥625)**

NATIONAL INSTITUTE OF SIDDHA

AYOTHIDOSS PANITHAR HOSPITAL, CHENNAI 600 047.

FORM IV PATIENT INFORMATION SHEET

Name of Principal Investigator : _____

Name of the institute : National Institute of Siddha,

Tambaram Sanatorium,

Chennai-47.

INFORMATION SHEET FOR PATIENTS PARTICIPATING IN THE OPEN CLINICAL TRIAL.

I, _____Studying as a PG Scholar at National Institute of Siddha, Tambaram Sanatorium, doing a clinical trial entitled on the study **"Mantha Sanni" (Autism Spectrum Disorder).**

"Mantha sanni (ASD) "a brain based disorder. It is an important socio behavioural problem affecting the children and characterized by difficulties in social interaction, verbal and non verbal communication and repetitive behaviour.

As per the siddha text book Kuzhandhai Maruthuvam (Bala vaagadam)**, Autism** is termed as **Mantha sanni** which is respectively மந்தம் என்பது அருவ நிலையில் அகக்கருவியாகிய மனம் , புத்தி , அகங்காரம், சித்ததிலும் மந்தம் & சன்னி என்பது அறிவு கலக்கம், வாய் பிதற்றல், இடை விடாமல் அலறுதல். The symptoms of மந்த சன்னி are about resembled with Autism Spectrum Disorder (ASD).we are treating with Brami nei, Amukura tablet, Muthuchipi parpam in our OPD.

So I would like to conduct an open clinical trial on **Mantha sanni (ASD**) with the Internal medicine **Kuruver Kudineer** which is mentioned in the Siddha literature of **Aathma ratchamirthammenum vaithya sarasangiragam**- Kandha saami mudhaliyaar Pg.no: 265 and external therapy **Sambrani Thuvalai & Mysatchi pugai** respectively in **Thanvanthri thylam – 500,**Thanvanthri , P.no:29 & **Kuzhandhai Maruthuvam (Bala vaagadam)** k.s.Murugesha Muthaliyaar, Maru . Pon. Guru.sironmani P.no: 168.

In this regard, I would like to ask you few questions. I will maintain confidentiality of your comments and data obtained. Taking part in the study is voluntary. No compensation will be paid to you for taking part in this study. It may be benefit to our community, as it may help us to understand the problem of defaulters and potential solutions.

If you agree your child to be a participant in this study, he/she will be included in the study primarily by signing the consent form and then you will be given the internal medicine " clinical evaluation of kuruver kudineer (internal medicine) [3 to 6 years - 30 ml, 6 to 9

years - 40 ml, 9 to 12 years -50 ml -twice a day] and Sambrani Thuvalai and Mysatchi pugai (external medicine). The medicine will be provided free of cost. Children will attend the OPD regularly or admitted IPD for external therapy . If you are not willing to take part of this study you will be treated with the medicine available in NIS with full care.

The trail drug contain the following ingredients such asவெட்டிவேர் (*Vettivera zizanoides*), விலாமிச்சு (*Plectranthes vettiveroides*) , சுக்கு (*Zingiber officinalae*) , பற்படாகம் (*Hedyotis corymbosa*) , சிறுதேக்கு (*Clerodendrum seratum*)

Most of the ingredients of Mantha sanni possess the anxiolytic activity, antioxidant, analgesic and CNS depressant which may be helpful in calming the brain. The raw drugs will be purchased from a reputed country shop and after purification; the medicine will be prepared in the Gunapadam laboratory of NIS under the proper guidance of the guide.

The information I am collecting in this study will remain between you and the principal investigator (myself). I will ask you few questions through a questionnaire. The questionnaire will take approximately 1 hour of your time.

If you wish to find out more about this study before taking part, you can ask me all the questions you want or contact Dr.G.DHARSHINI PRIYA, III yr PG Scholar .principal investigator of this study through 9994998821.Till now there is no adverse effect noted with this medicine. However if you noticed your child has any illness you can contact through phone number at any time. You can also contact the Member-secretary of Ethics committee, National Institute Siddha, Chennai 600047, Tel no: 91-44-22380789, for rights and participation in the study.

தகவல் படிவம்

மந்த சந்நி நோய்க்கான சித்த மருந்துகளின் குருவேர் குடிநீர் (உள் மருந்து) மற்றும் சாம்பிராணி துவாலை, மைசாட்சி புகை (வெளிமருந்து) பரிகரிப்பு திறனைக் கண்டறியும் மருத்துவ ஆய்விற்கான தகவல் படிவம்.

முதன்மை ஆராய்ச்சியாளர் பெயர் : Dr.க.தர்ஷினி பிரியா

நிறுவனனத்தின் பெயர் : தேசிய சித்த மருத்துவ நிறுவனம்,
தாம்பரம் சனட்டோரியம்,
சென்னை.

தேசிய சித்த மருத்துவ நிறுவனத்தில் பட்ட மேற்படிப்பு பயின்று வரும் நான் மந்த சந்நி என்னும் நோயில் மருத்துவ ஆராய்ச்சியில் ஈடுபட்டுள்ளேன். இந்த ஆராய்ச்சி சம்மந்தமாக சில கேள்விகள் கேட்கவும், தேவையான ஆய்வக பரிசோதனைக்கு தங்களது குழந்தையை உட்படுத்தவும் உள்ளேன்.

மந்த சந்நி (ASD) என்பது மூளை சார்ந்த குறைபாடு. இது குழச்தைகளை பாதிக்கும் ஒரு முக்கிய சமூக நடத்தைப் பிரச்சனைகள் , வாய்மொழி தொடர்பு சிக்கல்கள் மற்றும் சமூக ஊடாடல் ஒரே செயலைத் திரும்பச் செய்யும் அறிகுறிகளாகும்.

குழந்தை மருத்துவம் (பால வாகடம்) சித்த மருத்துவ உரை ஏட்டின்படி மந்தம் என்பது அருவ நிலையில் அகக்கருவியாகிய மனம், புத்தி, அகங்காரம், சித்ததிலும் மந்தம் மற்றும் சன்னி என்பது அறிவு கலக்கம், வாய் பிதற்றல், இடை விடாது அலறுதல். மேலும் இக்குறிகுணங்கள் முறையே ஆட்டிசம் எனபடுவதுடன் ஒத்துள்ளன. இவ்வித குறிகுணங்கள் உள்ள குழந்தைக்கு அமுக்குரா பொடி, பிரமி நெய் போன்ற மருந்தினை இந்த மருத்துவமனை வழக்கில் உள்ளது.

உங்கள் குழந்தை சம்பந்தமாக நான் தங்களிடம் சில கேள்விகளைக் கேட்க வேண்டும். இந்த ஆய்வில் பங்கேற்பது தங்களின் சொந்த விருப்பத்திற்குரியது. மேலும் உங்கள் குழந்தையின் அனைத்து விவரங்களும் ரகசியமாக வைக்கப்படும் என உறுதி அளிக்கிறேன்.இதில் பயணப்படி முதலிய எந்த உதவி தொகையும் வழங்கப்பட மாட்டாது. இந்த ஆராய்ச்சியின் போது தங்களது குழந்தையின் உடலுக்கு வேறு பாதிப்பு பட்சத்தில் தேசிய சித்த மருத்துவமனையில் தக்க சிகிச்சை அளிக்கப்படும்.

இந்த ஆராய்ச்சியில் உங்கள் குழந்தை பங்கேற்பாளராக இருப்பதற்கு நீங்கள் ஒப்புக் கொண்டு இப்படிவத்தில் கையொப்பம் இடுவதன் மூலம் குருவேர் குடிநீர் உள் மருந்தாக 90 நாட்கள் எடுக்க வேண்டும் (3-6 ஆண்டுகள் - 30 மி.லி.,

7-9 ஆண்டுகள் - 40 மி.லி., 10-12 ஆண்டுகள் - 50 மி.லி.,) மேலும் சாம்பிராணி துவாலை, மைசாட்சி புகை வெளிப்புற சிகிச்சையாக 90 நாட்கள் அளிக்க வேண்டும். தங்களின் விருப்பத்திற்கு ஏற்ப வெளி நோயாளர் பிரிவு (அ) உள் நோயாளர் பிரிவில் கலந்து சிகிச்சை மேற்கொள்ளலாம். இதில் கலந்துள்ள மருந்துப்பொருட்களின் செயல்பாடு மைய நரம்பு மண்டலத்தை சரிவர இயக்கி மூளையை அமைதிபடுத்தும்.

இம்மருந்து பொருட்களை நாட்டு மருந்து கடையிலிருந்து வாங்கி பின்பு குணபாடம் ஆய்வகத்தில் உள்ள தக்க மருத்துவ அதிகாரியின் வழிகாட்டுதலின்மூலம் மருந்து தயாரிக்கப்படும்.

இந்த ஆராய்ச்சியில் நோயினராக சேர்ந்த பிறகு உங்களுக்கு வருப்பம் இல்லையெனில் எப்போது வேண்டுமானாலும் தங்களது குழந்தையை விலக்கிக் கொள்ளலாம்.

இந்த ஆராய்ச்சி சம்மந்தமாக மற்ற விவரங்களை அறிவதற்கு முதன்மை ஆராய்ச்சியாளரான Dr. க.தர்ஷினி பிரியா (பட்ட மேற்படிப்பாளர் குழந்தை மருத்துவ பிரிவு) கைபேசி எண் : 9994998821 தொடரிபு கொள்ளலாம்.

மேலும் இந்த ஆராய்ச்சிக்கு IEC (நிறுவன நீதிநெறிகுழு) சான்று பெறப்பட்டுள்ளது இந்த மருந்து சிறப்பாக மந்த சந்நி நோய்க்காக அங்கீகரிக்கப்பட்ட சித்த மருத்துவ நூலில் கூறப்பட்டுள்ளது. மேலும் உணவு முறையில் பத்தியம் காக்குமாறு அறிவுறுத்தப்படுகிறது.

NATIONAL INSTITUTE OF SIDDHA

AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

POST GRADUATE DEPARTMENT OF KUZHANDHAI MARUTHUVAM

Clinical Evaluation Of Kuruver Kudineer (Internal Medicine) , Sambrani Thuvalai And Mysatchi Pugai (External Medicine) For Mantha Sanni In Children.

DRUG COMPLAINCE-VI

Protocol no: **Principle Investigator: Dr.G.Dharshini priya**

Clinical trial registry no: CTRI/2017/05/008698 Serial.No:

DATE	OP.NO / IP.NO	NAME	AGE / SEX	DATE OF ENROLLMENT &DATE OF COMPLETION	INFORMANT	RELIABLITY

Internal medicine:

NAME OF THE DRUG : kuruver kudineer

FORM OF THE DRUG : liquid

ADMINISTRATION : PER ORAL

DOSE & DURATION : 3 to 6 years - 30 ml(bds)

6 to 9 years - 40 ml(bds)

9 to 12 years -50 ml(bds) for 96 days

NO. OF DRUG PACKETS GIVEN: _____

NO. OF DRUG PACKETS RETURNED: _____

External medicine :

i)NAME OF THE DRUG: Sambrani thuvalai

ADMINISTRATION: Thuvalai

DURATION : Once in a alternate days (21 days)

ii) NAME OF THE DRUG: Mysatchi pugai

ADMINISTRATION: fumigation

DURATION : Every Alternate Week

Date: Signature of Investigator

NATIONAL INSTITUTE OF SIDDHA

AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

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Clinical Evaluation of Kuruver Kudineer (Internal Medicine) , Sambrani Thuvalai And Mysatchi Pugai (External Medicine) For Mantha Sanni In Children.

FORM VI– WITHDRAWAL FORM

Principle Investigator: Dr.G.Dharshini priya

Clinical trial registry no: CTRI/2017/05/008698 Serial.No:

DATE	OP.NO / IP.NO	NAME	AGE / SEX	DATE OF ENROLLMENT	INFORMANT	RELIABLITY

Date of trial commencement :

Date of withdrawal from trial :

Reason(s) for withdrawal :

Long absence at reporting : Yes/ No

Irregular treatment : Yes/ No

Shift of locality : Yes/ No

Complication adverse reactions if any : Yes/ No

Exacerbation of symptoms : Yes/ No

Patient not willing to continue : Yes/ No

Date: Signature of Investigator

NATIONAL INSTITUTE OF SIDDHA

AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

POST GRADUATE DEPARTMENT OF KUZHANDHAI MARUTHUVAM

Clinical Evaluation Of Kuruver Kudineer (Internal Medicine) , Sambrani Thuvalai And Mysatchi Pugai (External Medicine) For Mantha Sanni In Children.)

FORM -VII ADVERSE REACTION FORM

Protocol no: **Principle Investigator: Dr.G.Dharshini priya**

Clinical trial registry no: CTRI/2017/05/008698 Serial.No:

DATE	OP.NO / IP.NO	NAME	AGE / SEX	DATE OF ENROLLMENT &DATE OF COMPLETION	INFORMANT	RELIABLITY

Date of trial commencement :

Date of withdrawal from trial :

Description of adverse reaction :

Date: Signature of Investigator

FORM VIII – PHARMACOVIGILANCE FORM

1. Patient / consumer identification (please complete or tick boxes below as appropriate)

NATIONAL PHARMACOVIGILANCE PROGRAMME FOR SIDDHA DRUGS

Reporting Form for Suspected Adverse Reactions to Siddha

Please note: i.All consumers / patients and reporters information will remain confidential.
ii. It is requested to report all suspected reactions to the concerned, even if it does not have complete data, as soon as possible.

Peripheral Center code: State:

<table>
<tr><td>Name</td><td>Father name</td><td rowspan="2">Patient / Record No.</td></tr>
<tr><td>Ethnicity</td><td>Occupation</td></tr>
<tr><td colspan="2" rowspan="2">Address
Village / Town
Post / Via
District / State</td><td>Date of Birth / Age:</td></tr>
<tr><td>Sex: M / F
Weight :
Degam:</td></tr>
</table>

2. Description of the suspected Adverse Reactions (please complete boxes below)

Date and time of initial observation		Season:
Description of reaction		Geographical area:

3. List of all medicines / Formulations including drugs of other systems used by the patient during the reporting period:

Medicine	**Daily dose**	**Route of administration & Vehicle - Adjuvant**	**Date**		**Diagnosis for which medicine taken**
			Starting	**Stopped**	
Siddha					
Any other system of medicines					

4. Brief details of the Siddha Medicine which seems to be toxic:

Details	Drug – 1	Drug – 2	Drug - 3
a) Name of the medicine			
b) Manufacturing unit and batch No. and date			
c) Expiry date			
d) Purchased and obtained from			
e) Composition of the formulation / Part of the drug used			

b) Dietary Restrictions if any

c) Whether the drug is consumed under institutionally qualified medical supervision or used as self medication.

d) Any other relevant information.

5. Treatment provided for adverse reaction:

6. The result of the adverse reaction / side effect / untoward effects (please complete the boxes below)

Recovered:	Not recovered:	Unknown:	Fatal:	If Fatal Date of death:
Severe: Yes / No.	Reaction abated after drug stopped or dose reduced:			
	Reaction reappeared after re introduction:			

Was the patient admitted to hospital? If yes, give name and address of hospital	

7. Any laboratory investigations done to evaluate other possibilities? If yes specify:

8. Whether the patient is suffering with any chronic disorders?

Hepatic Renal Cardiac Diabetes Malnutrition

Any Others

9. H/O previous allergies / Drug reactions:

10. Other illness (please describe):

11. Identification of the reporter:

Type (please tick): Nurse / Doctor / Pharmacist / Health worker / Patient / Attendant / Manufacturer / Distributor / Supplier / Any others (please specify)
Name:
Address:
Telephone / E – mail if any :

Signature of the reporter: **Date:**

Please send the completed form to:

Name & address of the RRC-ASU/ PPC-ASU

The Director

National Institute of Siddha,

(Pharmacovigilance Regional Centre For Siddha Medicine),

Tambaram Sanatorium, Chennai-600 047.

☏ (O) 044-22381314 Fax : 044 – 22381314

Website : www.nischennai.org

Email: nischennaisiddha@yahoo.co.in

* ** * * * *

This filled-in ADR report may be sent within one month of observation /occurrence of ADR

	Who Can Report?
What to Report?	⇒ Any Health care professionals like Siddha Doctors / Nurses / Siddha Pharmacists / Patients etc.
Confidentiality	⇒ All reactions, Drug interactions,
	⇒ The patient's identity will be held in strict confidence and protected to the fullest extent. ⇒ Submission of report will be taken up for remedial measures only not for legal claim

Date:

Station:

Signature of the Investigator:

Signature of the Lecturer: Signature of the HOD

NATIONAL INSTITUTE OF SIDDHA

AYOTHIDOSS PANDITHAR HOSPITAL, CHENNAI – 600 047.

POST GRADUATE DEPARTMENT OF KUZHANDHAI MARUTHUVAM

Clinical evaluation of Kuruverkudineer (internal medicine) ,Sambranithuvalai and Mysatchipugai (external medicine) for MANTHA SANNI in children

FORM IV-DIETARY ADVICE FORM

THINGS TO TAKE

1. Increased intake of omega 3 fatty acid
2. Increase intake of vitamins and minerals
3. Intake of almond milk,Wallnut
4. A natural food as organic which is easily digestable and absorbed
5. Intake of Fresh fruits and Juices
6. Drink Cumin seeds water
7. Intake of all types spinaches weekly twice

THINGS TO AVOID

1. Gluten like wheat should be avoided
2. Caisen like dairy products , yoghurts and soy should be avoided
3. Avoid junk food, pasta, pizza burger and artificial food items etc…
4. Avoid broiler chicken and white sugar

THE TAMIL NADU Dr.M.G.R. MEDICAL UNIVERSITY, GUINDY, CHENNAI-32

DEPARTMENT OF SIDDHA

XXII WORKSHOP ON "RESEARCH METHODOLOGY AND BIO STATISTICS"

Attendance Certificate

This is to certify that Dr G. D Rao Shiva Pooja of National Institute of Siddha, Tambaram Sanatorium, Chennai-600 047 has attended the WORKSHOP ON "RESEARCH METHODOLOGY AND BIO STATISTICS" from 06.06.2016 to 10.06.2016at The Tamil Nadu Dr MGR Medical University, Chennai-32.

DEPT. OF SIDDHA
10 JUN 2016
CHENNAI-32
The TN Dr. M G R Medical University

Dr.N.Kabilan
Prof & Head, Dept. of Siddha

The Tamil Nadu Dr.M.G.R.Medical University

69, Anna Salai, Guindy, Chennai - 600 032.

This Certificate is awarded to Dr/~~Mr/Mrs~~...G:..DHARSHINI...PRIYA.....

For participating as ~~Resource Person~~ / Delegate in the Twenty second Workshop on

"RESEARCH METHODOLOGY & BIOSTATISTICS"

*For **AYUSH Post Graduates & Researchers***

Organized by the Department of Siddha

The Tamil Nadu Dr. M.G.R. Medical University From 06th to 10th June 2016.

Dr.N.KABILAN, M.D.(S)
PROF & HEAD
DEPT.OF SIDDHA

Prof.**Dr.S.PUSHKALA,** M.D.,
REGISTRAR (FAC)

Prof. **Dr.S.GEETHALAKSHMI,** M.D., Ph.D.,
VICE CHANCELLOR

NATIONAL INSTITUTE OF SIDDHA, राष्ट्रीय सिद्ध संस्थान
Ministry of AYUSH- आयुष मंत्रालय
GOVERNMENT OF INDIA भारत सरकार
TAMBARAM SANATORIUM, CHENNAI -600 047 तांबरम सानटोरियम, चेन्नई -600 047
दूरभाष/Tele : 044-22411011 फैक्स/Fax : 22391314
ई-मेल nischennaisiddha@yahoo.co.in वेब www.nischennai.org

F.No.NIS/6-20/IEC/15-16 Dt:14.10.2016

CERTIFICATE

Address of Ethics Committee: National Institute of Siddha, Tambaram Sanatorium, Chennai-600047, Tamil Nadu, India	
Principal Investigator: Dr. G.Dharshini Priya- I year, Dept.of Kuzhanthai Maruthuvam	
Protocol Title:- A Clinical Assessment and Evaluation of Mansha Sanni (Autism Spectrum Disorder) with Siddha Therapeutic Management in Children.	
Documents filed	1) Protocol, 2) Data Collection forms
Clinical trial Protocol (others – Specify)	**Yes-(M.D-Dissertation)**
Informed consent documents	**Yes**
Any other documents	-
Date of IEC approval & its number	**NIS/IEC/2016/11-19/ 14.10.2016**

We approve the trial to be conducted in its presented form.
The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study.

(Dr.V.Subramanian)
Chairman

(Prof.Dr.V.Banumathi)
Member Secretary

CERTIFICATE

This is to certify that the project title Evaluation of the pharmacological profile of Siddha drug "Karuvur Kudineer" (ayurveda) in the treatment of "Mandhasaaram" (Autism) Has been approved by the IAEC. Approval No: NIS/IAEC-II/Aug 2016 Dt 2-24 Nos. (12 Male + 12 Female)

Prof. Dr. V. RAVINDHATHI
Chairman IAEC:

Prof. Dr. K. Nachimuthu
CPCSEA nominee:

Signature with date

Chairman/Member Secretary of IAEC:

CPCSEA nominee:

(Kindly make sure that minutes of the meeting duly signed by all the participants are maintained By Office)

Name of the Principle Investigator: Dr. G. Dhanasekaran Pillai
PG Scholar (2nd year)

Name of the Institution: National Institute of Siddha

Name of the Department: Kuzhanthai Maruthuvam

Clinical Trial Details (PDF Generation Date :- Mon, 09 Jul 2018 09:33:00 GMT)

CTRI Number	CTRI/2017/05/008698 [Registered on: 30/05/2017] - **Trial Registered Prospectively**
Last Modified On	29/05/2017
Post Graduate Thesis	Yes
Type of Trial	Interventional
Type of Study	Siddha
Study Design	Single Arm Trial
Public Title of Study	Mantha sanni (Autism Spectrum Disorder) in Children
Scientific Title of Study	A Clinical Assessment And Evaluation Of Mantha Sanni (Autism Spectrum Disorder) with the Siddha Therapeutic Management in Children.

Secondary IDs if Any

Secondary ID	Identifier
NIL	NIL

Details of Principal Investigator	
Name	GDharshini priya
Designation	Mantha Sanni - Autism Spectrum Disorder-[MS(ASD)]
Affiliation	National institute of siddha
Address	National institue of siddha , chennai. National institue of siddha , chennai. Chennai TAMIL NADU 600047 India
Phone	9994998821
Fax	09994998821
Email	dharshini874@gmail.com

Details of Principal Investigator or overall Trial Coordinator (multi-center study)

Details Contact Person (Scientific Query)	
Name	DrAArul Mozhi
Designation	lecturer
Affiliation	National institute of siddha
Address	National institue of siddha , chennai. National institue of siddha , chennai. Chennai TAMIL NADU 600047 India
Phone	9500151930
Fax	9500151930
Email	drarulmozhi@yahoo.co.in

Details Contact Person (Scientific Query)

Details Contact Person (Public Query)	
Name	DrMMeenakshi sundaram
Designation	Associative Professor
Affiliation	National institute of Siddha
Address	National institue of siddha , chennai. National institue of siddha , chennai. Chennai TAMIL NADU 600047 India
Phone	9940266442

Details Contact Person (Public Query)

Fax	9940266442
Email	mmssiddha@rediffmail.com

Source of Monetary or Material Support

Source of Monetary or Material Support
> National institute of Siddha, Tambaram Sanatorium, Chennai-47

Primary Sponsor

Primary Sponsor Details	
Name	DrGDharshini priya
Address	National institute of Siddha, Chennai- 47
Type of Sponsor	Research institution and hospital

Details of Secondary Sponsor

Name	Address
NIL	NIL

Countries of Recruitment

List of Countries
India

Sites of Study

Name of Principal Investigator	Name of Site	Site Address	Phone/Fax/Email
DrGDharshini priya	National institute of Siddha	Department of Kuzhandai maruthuvam, Room no :9 Chennai TAMIL NADU	9994998821 9994998821 dharshini874@gmail.com

Details of Ethics Committee

Name of Committee	Approval Status	Date of Approval	Is Independent Ethics Committee?
Institutional ethical committee	Approved	14/10/2016	No

Regulatory Clearance Status from DCGI

Status	Date
Not Applicable	No Date Specified

Health Condition / Problems Studied

Health Type	Condition
Patients	Childern with Autism spectrum disorder

Intervention / Comparator Agent

Type	Name	Details
Intervention	Internal Medicine	vettiver(Vettivera zizanoides)- 1/4 palam Vizhamichi (Plectranthes vettiveroides) - 1/4 palam Chukku (Zingiber officinalae) - 1/4 palam Parpadagam(Hedyotis corymbosa)- 1/4 palam Siruthaekku (Clerodendrum seratum) - 1/4 palam
Comparator Agent	External medicine - Sambirani Thuvali and Mysatchi Pugai	External therapy - 3 months SAMBIRANI THUVALAI -Velerukkan samoolam (Caloptoria gigantea) -Sambirani kudineer (Styrax benzoin) -Vaeppam ennai(Neem Oil) MYSATCHI PUGAI -Mysatchi(Shorea rubusta) -Agirkattai(Aquillaria achallocha) -Sanni naayagam (Nigella sativa) -Sambirani(Styrax benzoin) -velaiver (Cleome gynandra) -sathisaaranai (Trianthema

		decandra)

Inclusion Criteria

Inclusion Criteria	
Age From	3.00 Year(s)
Age To	12.00 Year(s)
Gender	Both
Details	• Children of age group under 3- 12 years • Clinically diagnosed as a ASD • Impaired social interaction • Mild aggressive • Repetitive behaviour • Lack of eye contact • Blabble sound

Exclusion Criteria

Exclusion Criteria	
Details	• H/o epilepsy • H/o severe aggressive with ADHD • H/o cerebral palsy • H/o congenital heart disease • Any other serious illness

Method of Generating Random Sequence	Not Applicable
Method of Concealment	
Blinding/Masking	

Primary Outcome

Outcome	Timepoints
A Clinical Assessment and Evaluation of ManthaSanni (Autism Spectrum Disorder) with Siddha Therapeutic Management in Children	30 patients

Secondary Outcome

Outcome	Timepoints
To renovate the social impairment, eye contact and to slow down the behaviour wise emotional, repetitive hyperactive and blabble unwanted echoes .	30 patients

Target Sample Size	**Total Sample Size=**30 **Sample Size from India=**30
Phase of Trial	Phase 3
Date of First Enrollment (India)	05/06/2017
Date of First Enrollment (Global)	No Date Specified
Estimated Duration of Trial	**Years=**2 **Months=**0 **Days=**0
Recruitment Status of Trial (Global)	Not Applicable
Recruitment Status of Trial (India)	Not Yet Recruiting
Publication Details	None yet
Brief Summary	A Clinical Assessment and Evaluvation of Mantha Sanni (Autism Spectrum Disorder) with the Siddha Therapeutic management in Children

NATIONAL INSTITUTE OF SIDDHA

(An Autonomous body under Ministry of AYUSH, Govt. of India)
Tambaram Sanatorium, Chennai- 600 047

Workshop on

"BASIC RESEARCH TECHNIQUES AND PRACTICES INVOLVED IN LABORATORY ANIMAL CARE"

06 -10 February 2017

CERTIFICATE

This is to certify that Dr. G. Dharshini priya has participated as Delegate/~~Resource~~ Person in the workshop on "Basic Research Techniques and Practices involved in Laboratory Animal Care" held on 06-10 February, 2017 at National Institute of Siddha, Chennai-47, Tamilnadu.

Dr. V. Suba
Organizing Secretary

Dr. P. Muthusamy
Veterinary Consultant

Prof. Dr. V. Banumathi
Director / Chairperson

NATIONAL INSTITUTE OF SIDDHA, CHENNAI – 600047

BOTANICAL CERTIFICATE

Certified that the following plant drugs used in the Siddha formulations **"Kuruver Kudineer"** (Internal), **Samhran Thuvalai** and **Mysatzhi Pugai** (External) taken up for Post Graduation Dissertation studies by **Dr.G.Dharshini Priya** M.D.(S), II year, Department of Kuzhandhai Maruthuvam, 2017, are identified through Visual inspection, Experience, Education & Training, Organcleptic characters, Morphology and Taxonomical methods as

Vettiveria zizanoides (Linn.) Nash (Poaceae), Root

Plectranthus vettiveroides (Jacob) Singh & Sharma (Poaceae), Root

Zingiber officinale Rosc. (Zingiberaceae), Dried Rhizome

Hedyotis corymbosa (L.) Lam. (Rubiaceae), Whole plant

Clerodendrum serratum (Linn.) Moon (Verbenaceae), Root

Calotropis gigantea (Linn.) R. Br. Ex Ait (Asclepiadaceae), Whole pant

Styrax benzoin Dryand. (Styraceae), Resin

Azadirachta indica A. Juss. (Meliaceae) Seed oil

Shorea robusta Gaertn.f. (Dipterocarpaceae), Oleo-resin

Aquilaria agallocha Roxb. (Thymelaeaceae), Heart wood

Nigella sativa Linn. (Ranunculaceae), Seed

Cleome viscosa Linn. (Cleomaceae), Root

Trianthema decandra Linn. (Ficoidaceae), Root

MEDICINAL BOTANY CHENNAI 600 047 National Institute of Siddha

Certificate No: NISMB3002017

Date: 12-06-17

Authorized Signatory

Dr. D. ARAVIND, M.D.(s),M.Sc.,
Assistant Professor
Department of Medicinal Botany
National Institute of Siddha
Chennai - 600 047, INDIA

Government of India
Ministry of AYUSH

Siddhar Agathiyar
Father of Siddha Medicine

Certificate of Participation

This Certificate is proudly presented to

Dr. Darshini priya, NIS

for participating

in the National Conference on "*Prevention and Management of Lifestyle Disorders through Siddha system of Medicine*" on **the first Siddha Day** held on **04.01.2018** – organised by Central Council for Research in Siddha (CCRS) jointly with Directorate of Indian Medicine and Homoeopathy, Govt. of Tamil Nadu, The Tamil Nadu Dr. M.G.R. Medical University and National Institute of Siddha.

Prof. Dr. R. S. Ramaswamy
(Director General
Central Council for Research in Siddha)
Chairman

Prof. Dr. P. Parthiban
(Joint Director, DIM&H
Govt. of Tamil Nadu
Organising Secretary

Certificate. No: FSD/Part/ 824

SIDDHI CHARITABLE TRUST

15/1, Ramanujar Street, Pollachi. Tamil Nadu

PRISM

(PLATFORM FOR RESEARCHERS IN INDIAN SYSTEMS OF MEDICINE)

Certificate of Participation / Presentation

This is certify that

Dr/~~Mr./~~Ms. G. DHARSHINI PRIYA

has participated / Presented a Poster / Oral in the PRISM-4

held at MADURAI. on 17-07-2016

AN APPRAISAL OF NUTRITIONAL DIET PANCHAMUDICHI KANCHI FOR CEREBRAL PALSY CHILDREN

Dr. Ramasamy

Trustee, Siddhi Charitable Trust

CLINICAL RESEARCH & HOSPITALS (P) LTD

National Conference on

HERBAL MEDICINE AND ETHNOPHARMACOLOGY

Date: 06.04.2017; Venue: TICEL Biopark

This is to certify that Ms./Mr./Dr. ...Dharshini Priya S..., *Regd. from Dept.* of Kumaraguru ..... Arts and Science, Coimbatore Institute of Siddha, Chennai ..... *attended the National Conference on "**Herbal Medicine and Ethnopharmacology**" conducted in V.S. Clinical Research & Hospitals (P) Ltd., Chennai, Tamil Nadu. He/She presented a paper/poster in the topic* ...Therapeutic Management of Asthma with Salivric Siddha Formulation Sarvangi — A Review

How 3rd Pubs

Dr. T. Mathangi
Scientist & Coordinator

Dr. L. Lokeranjan
Chairman & Managing Director

3rd INTERNATIONAL CONFERENCE ON

"CHALLENGING EXCLUSION" ICCE - 2018

30th JANUARY - 02nd FEBRUARY, 2018

Jointly organised by

राष्ट्रीय बहुदिव्यांगता जन सशक्तिकरण संस्थान

NATIONAL INSTITUTE FOR EMPOWERMENT OF PERSONS WITH MULTIPLE DISABILITIES (DIVYANGJAN)

(DEPT. OF EMPOWERMENT OF PERSONS WITH DISABILITIES (DIVYANGJAN), MINISTRY OF SOCIAL JUSTICE & EMPOWERMENT, GOVT. OF INDIA)

& SRM INSTITUTE OF SCIENCE & TECHNOLOGY, CHENNAI

Knowledge Partner UNIVERSITY OF NORTHAMPTON, UK

CERTIFICATE OF PRESENTATION

This is to certify that Shri / Smt/Mr/Ms/Dr. Dhanshini Priya. G

presented scientific paper/poster titled Challenging Exclusionary factors in Autism Spectrum Disorder (Madha Sanai) with Siddha Dhanapudi Mangaiyar in Children : A Case Study

in the 3rd International conference on "Challenging Exclusion" held at SRM Institute of Science & Technology, Chennai from 30th January - 02nd February, 2018.

S. SANKARA NARAYANAN
ICCE-2018
Co-organising Secretary, DR(A)

Dr. NEERADHA CHANDRAMOHAN
Convener
Scientific committee

Dr. HIMANGSHU DAS
ICCE-2018
Organizing Secretary, Director